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VOLUME TWO NUMBER SIX

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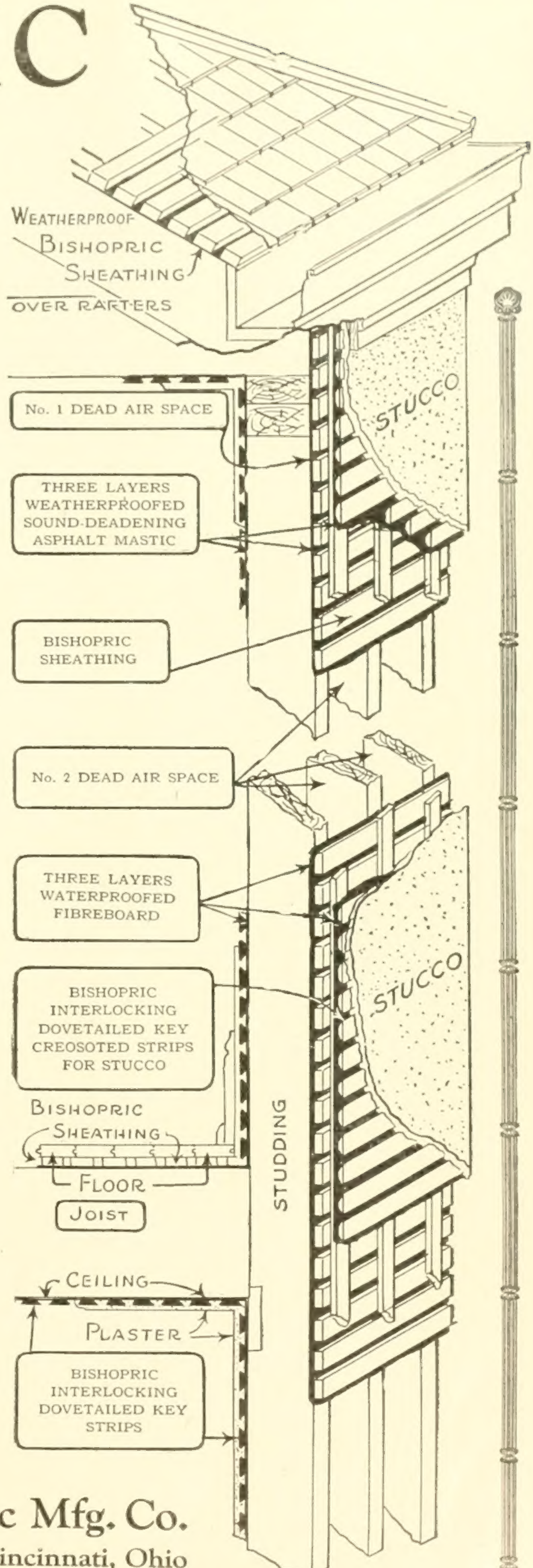
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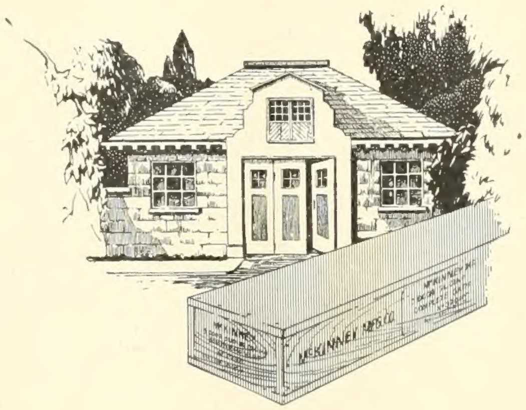
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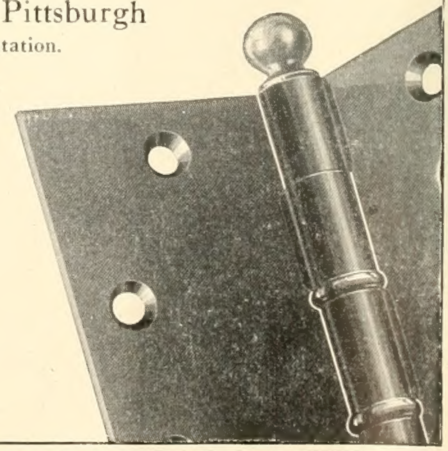

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THE BUILDERS' JOURNAL
*The Magazine of Better Building*

VOL. II, NO. 6
JUNE, 1921

# Dead Loads and Upgrades

THE building industry is struggling to come into its own. It is on the upgrade, toward a long level of prosperous activity.

The people want buildings. Builders wish to provide them—on a profitable basis.

When a farmer takes a load of hay or hogs to town, and finds it a hard pull for his horses, he gets off and *walks* on the upgrades. He knows the necessity of lightening the load.

It is a hard, uphill pull that the building industry has been through. The crest is almost in sight, but too many people are riding on the load. It is time to get off—and perhaps at the very crest it may be necessary to get hold of the wheel spokes to help pull the industry to a level of active production.

Today the general asking prices for buildings and the levels on which prospective owners are willing to go ahead are not very far apart. In some cases the difference involved is only 15 or 20 per cent. Labor has been called upon to contribute toward lightening the load; congress is about to ask the railroads to cut the costs of transporting materials; manufacturers have been contributing heavily, even to the point of selling at no profit or at an actual loss.

The building contractor has at least two ways of lightening the load. He can, and should, cut his profit to a minimum. He can also follow the material market more closely and extend his list of sub-contract bidders to take full advantage of every possible low figure and every drop in the market.

It is surprising to find what excellent results can be obtained today by this careful combing of the field. The day of relying upon one or two sub-contractors for figures is gone. Capable architects and engineers are taking bids on proposed work from much larger lists than ever before. In this way they come in contact with contractors who, by closely following the market, are both able and willing to give close figures in order to speed up the general activity of construction. In turn, the building contractor will find that by digging into the sub-contract field, and getting bids from a larger number, he will get lower prices than might be expected.

This is the time when "shopping" in the building material field brings excellent results. It is a time when every branch of the building industry should cut profits to the bone. Those who do their share now to lighten the dead load will be first to profit as the industry regains its full momentum.

# Current Notes and Comments

## Building Handicapped Generally by Wage Disputes

FROM reports made at Cleveland, May 11, from 20 cities in Ohio and western Pennsylvania, at the conference of general contractors and building trades employers, the move for an open shop in the building industry is gaining ground everywhere.

In Cleveland last week the Chamber of Commerce openly came out and begged of the building employers to do away with all collective bargaining and deal with their employes as individuals. All engaged in these wage disputes and uncalled-for demands are losers in the end, and are doing more than anything else right now in the large cities to keep construction from starting off with a bang. In Cleveland $28,000,000 in building was stopped May 1, while Toledo has contracts for $11,000,000 worth of work ready for starting at once. Pittsburgh is also idle, with $30,000,000 in building ready to go ahead. Wage losses alone throughout the country, in building crafts, have been close to $1,000,000 a day. (*Akron* (*Ohio*) *Builders' Bulletin.*)

## St. Joseph, Mo., Contractors Working Earnestly for Lower Costs

THE building employers of this city have been meeting together for the past 2 months in an effort to solve the building construction problem. The result of these several meetings was the formation of the Associated Building Trades Employers of St. Joseph, Missouri, with these officers elected: Sam Hotchkiss, President, C. L. Kennedy, Vice-president, and J. H. Vincent, Secretary-Treasurer.

After considerable discussion, the Employers decided that a cut in labor wages of approximately 20%, or a resumption of the scale of wages paid in the year 1919, was the only solution to make possible a proper readjustment. The reductions asked by the Employers were:

Plumbers from $10 per day to $8.
Carpenters from $7 to $6.
Electricians from $8 to $6.
Sheet metal workers from $8 to $6.
Painters from $7 to $6.
Plasterers from $9 to $8.
Brickmasons from $9 to $8.

Various members of the association made personal calls at the union organization meetings and explained to them the necessity of the wage cuts. After several conferences with the union organizations, the brickmasons and plasterers unions were the only workers to voluntarily reduce their scales, and since April 1, 1921, the rest of the union men in the trades mentioned have been out on strike.

As the situation stands at present, building construction is nearly at a standstill, although there seems to be an indication of an increase in building at an early date Although the open shop has not been officially adopted by the Associated Employers, some of them who are members of the association have put this policy into effect and report that they are getting excellent results therefrom. (*J. B. Brown, Commerce Club, St. Joseph, Mo.*)

## Pittsburgh Builders Offer New Wage Scale to Unions

AS June 1 draws near the labor unions are getting very anxious to negotiate agreements, but at this writing they have not become sufficiently interested to accept the wage scale and agreement submitted by the Building Construction Employers' Association. It is possible, however, that there may be some surprises on June 1, as the men in the ranks are anxious to accept a wage reduction if it will help to stabilize conditions.

The following is the wage scale offered by the employers to take effect June 1, 1921; overtime is figured at time and one-half on week days, and double time on Saturdays, Sundays and holidays.

| | Per hour |
|---|---|
| Asbestos workers | $ .90 |
| Bricklayers | 1.12½ |
| Carpenters | 1.00 |
| Cement finishers | .87½ |
| Composition roofers | .85 |
| Electricians | 1.00 |
| Hoisting engineers | 1.00 |
| Hod carriers | .80 |
| Laborers | open |
| Lathers | .90 |
| Marble cutters and setters | 1.00 |
| Painters and glaziers | 1.12½ |
| Plasterers | 1.00 |
| Plumbers | 1.00 |
| Sheet metal workers | 1.00 |
| Steam fitters | 1.00 |
| Stone masons | 1.00 |
| Structural iron workers | 1.00 |

## Richmond Has Lower Wage Scale and Good Prospects for Building

INDUSTRIAL conditions throughout the state are gradually rising above the slump into which they fell last winter, and the general outlook is much brighter than it was during the first months of the year. The element of greater stability is so pronounced as to lead to a prediction that before mid-year a much more definite turn for the better will be demonstrated. Building operations are continuing to show increases as the year advances. In the latter field the continued increase has developed into nothing short of a construction boom, which gives promise of relieving the housing shortage to a certain extent.

As far as can be learned, approximately $5,000,000 worth of building is either underway at the present time or is seriously contemplated by builders of the city. No less than four office buildings, ranging in size from 6 to 20 stories, are being contemplated, and plans are being drawn for their erection. Hundreds of much needed homes will be started this spring, either in the city or surrounding territory.

During March a total of 126 permits were issued for new structures to cost approximately $926,359, exceeding the total for the 2 preceding months. The increase in new work authorized in March, 1921, as compared with March, 1920, was $367,354.

Although little has been said upon the subject, labor has, in almost every instance in Richmond, reduced its wage scale voluntarily to near that of pre-war days. (*R. L. Shotwell, Richmond, Va.*)

## State Appropriation for Public Buildings Promises Activity in Missouri

INTEREST in the construction business in Missouri at present is centered about the announcement from numerous cities that a building boom has been started and that more residences, factories, municipal plants and smaller buildings will be erected this summer and fall than for almost the entire decade preceding 1921, and that Gov. Arthur B. Hyde of Missouri has approved a building appropriation of the last legislature totaling $3,630,417.

At least 15 Missouri towns are interested in the legislative appropriations, for it means that several hundred thousand dollars will be spent in each of them for modern buildings of every kind. They will be for use of the charities and educational institutions of these towns. The total appropriation that Gov. Hyde has approved is in excess of all appropriations given to these schools and institutions in the past 10 years.

The University of Missouri leads in the amount of appropriations secured, $839,500 being given it for at least a half-dozen new buildings.

Fulton, Farmington, St. Joseph, Nevada, Maryville, Kirksville, Cape Giradeau, Springfield, Warrensburg, Mt. Vernon, Jefferson City, Marshall, Chillicothe, Boonville, Tipton and Rolla are the towns in which the state institutions are located, and they will be the beneficiaries under the allowance on the part of the state. It will mean not only a great deal of work for craftsmen in the various towns, but will also afford work for a lot of men from other cities as there is scarcely a town in the list, with the possible exceptions of St. Joseph and Springfield, that can handle the operations with local mechanics.

Typical of the building conditions in the interior cities of Missouri, can be cited those in Fulton, where at least $500,000 worth of construction work will be done this summer. All craftsmen in Fulton have taken a voluntary reduction in wages, and this has stimulated new work.

In Springfield the announcement is made that at least $2,000,000 of new construction work will be carried out this summer and fall, and it is the biggest program of building according to contractors that has been outlined in that city in a number of years.

From Cape Giradeau, the hub of southeast Missouri, we quote: "The reduced costs of building materials and labor promise to greatly stimulate building in this city during the coming summer. An 8-room dwelling house of the average city type can be built today at one-third less than it would have cost one year ago."

In St. Louis there is great building activity. Labor conditions are better than they were a month ago, and it seems as if the leaders have prevailed on the men to take a fair reduction in wages as their part of readjusting business. (*Paul J. Pirmann, Fulton, Mo.*)

(*Continued on page 50*)

# The Deadlock in Housing

## New methods of financing and building must be developed. Suggestions for local housing companies

*By Leslie H. Allen*

*Fred T. Ley & Co., Inc., General Contractors*

IN one of his fables La Fontaine tells of the Bear and the Gardener, who lived amicably together, each assisting to supply the needs of the other. One of the Bear's self-appointed tasks was to fan flies from the face of his friend. Being particularly annoyed one day with a persistent fly, which repeatedly settled on the Gardener's nose and disturbed his sleep, the Bear picked up a handy paving stone and slew the fly, but unfortunately also crushed the man's head in. "A crafty foe is not so dangerous as a foolish friend" is the poet's pithy comment.

The summer of the year 1921 finds us with the deadlock in the housing situation still unbroken. The speculative builder is still unable to borrow, at reasonable rates, the funds needed to carry on his business, and for such houses as he succeeds in building, with his own capital, the market is very uncertain.

Chamber of Commerce Housing Committees, Municipal Inquiries, Rent Profiteering Investigations and Laws, and "Build Now" Campaigns have so far failed to encourage anyone to invest further in the perilous business of landlording, and the average householder will soon be feeling as grateful to those remedial agencies as the Gardener was to the Bear in La Fontaine's fable. Unless we follow the example of the British Government in subsidizing housing, no relief in the housing shortage can be expected until it becomes reasonably profitable to own and rent houses, or until all our people become house owners instead of tenants.

An instructive lesson may be drawn by observing the large number of garages that have been built during the year in spite of the shortage of houses. The writer's car is kept with two others in a 3-car garage belonging to a neighbor. This garage cost $1,400 to build, and the value of the land occupied by the garage and driveway may be estimated at $200,—total $1,600. For this $1,600 investment the owner receives a rent of $8 per car per month,—total $288 per annum. The rent paid is the usual rent in the neighborhood. After paying for taxes, insurance and light, and writing off a proper reserve for depreciation, maintenance and vacancies, the owner's investment in this garage nets him a return of about 11%, and none of his tenants are accusing him of being a profiteer.

An automobile occupies about as much floor space as a small room in an average house, but the house costs twice as much per room to build; yet the tenant of an 8-room house, properly fitted up with heating, electric wiring, modern plumbing, well finished and standing on a $1,000 lot, would think that $8 per room, or $64 per month, would be quite a high rent. Such a rent would show a much smaller return to the owner than the rent of a garage, and depreciation and maintenance would be much higher.

Until the tenant understands that the ownership of houses has got to be a profitable investment, and cheerfully pays a sufficient rent to make it so, the deadlock will continue. More study has been given to the building of small houses by expert architects, engineers and

**Careful placing and varied materials make a few designs sufficient. There are 90 houses in this development**

**Standardized design need not be monotonous, as is proved by these cottages at Worcester, Mass. Fred. T. Ley & Co., contractors; Grosvenor Atterbury, architect**

builders in the past 4 years than ever before, yet we are still building houses in the good old-fashioned way; no new materials or methods have been discovered that make any appreciable difference in the cost of building a house. The construction of houses is usually done in a very expensive and wasteful way. There is no other commodity necessary to human life in producing which (speaking generally) less skill is used, less quality obtained, or more wasteful methods applied. In order to produce houses more cheaply, we should, instead of looking for some wonderful new method, apply common sense business methods to the business in hand. This cannot be done without capital.

It is conceivable that a good mechanic, with a very small capital, could produce in a small shop an automobile equal in horse-power and general usefulness to a Ford car, but the cost in time, effort and money would probably be three or four times the selling price of the Ford car, and the product would be crude. A Ford car can only be produced at the price at which it is sold by the employment of capital in the establishment of an efficient manufacturing plant, and with efficient manufacturing and sales methods.

A custom-made suit of clothes costing $80 can be sold in quantities, with the same cloth, but made in a factory, for $50. The employment of factory methods in the production of the various commodities of life has in every case resulted in very large reductions in production and selling costs, although the producers have made more profit. The historic case of the Standard Oil Co. is perhaps the most striking illustration of this. There is no question that they very materially reduced the price of oil, and the profit they piled up in so doing was enormous.

The local builder, in building a few houses for sale, produces the houses in the most expensive way possible. All his purchasing has to be done at retail, and usually he does not have enough capital to discount his bills. His men do not have steady employment, and they cannot be trained to the particular job in hand. As a rule, each house is different in design, and there is no possibility of applying scientific methods of planning operations and keeping gangs of men continuously at one kind of work from week to week. His capital is small. He has to borrow on construction loans, at high rates and heavy discounts, and as a rule the houses resulting from his operations are disappointing in quality and relatively high in cost. He cannot organize departments to carry on all branches of his work and has to sublet to other men contracts for plumbing, plastering, painting, electrical work, etc. These subcontracts often amount to 40 or 50% of the cost of the house. Each subcontractor has to figure on his own overhead expense and profit, which becomes part of the cost of the house.

An attempt has been made to produce houses on a factory production basis by firms selling so-called ''ready-cut'' houses, but they have not attacked or solved the basic difficulties of the problem. They aim to supply the lumber and millwork required, shipped in a car to the job, but this lumber and millwork amount to only a small part of the cost of the house, and excepting under certain favorable conditions the wastefulness of organization and construction work in the field are not reduced.

A big opportunity presents itself for the introduction of capital into the house building business and establishing the production of homes on a more economic basis, like the production of automobiles, shoes, typewriters, or any other commodity essential to human welfare and progress.

The results of the 1920 census show that the population of the large cities of New England has been growing at an average rate of 1½% per annum during the last 10 years. Starting off with the house shortage and figuring on the same increase in population, it would seem that a steady market could be assured in any city, for a company established to produce houses on a quantity basis, as cars are produced in an automobile plant, or even at the rate of 1 or 2 per week. Take, for example, the city of Worcester, Mass.; it has now a shortage of about 2,000 houses. An increase in population at 1½% per annum would mean an annual increase of 3,000 persons. Allowing 5 people to a house, this would call for 600 houses per annum. A housing company in Worcester would start, therefore, with a demand for 2,000 houses, with an additional market of 600 houses per annum. Of course one housing company could not secure all of this business, but a housing company organized to produce 100 or 200 houses per year in this city would be fairly sure of its market, especially if it could produce a better house at a cost lower than usual.

The housing companies organized by community effort or by Chambers of Commerce have usually, with a desire to gain immediate relief, let contracts for a large number of houses to be built quickly. The result has been disappointing, as the number of houses thrown on the market at once has been too great for the city to absorb. In many cases the cities have had to rent their houses, as it was too difficult to sell them all at once, and once rented it has been hard to find purchasers later on.

Organized with a paid-in capital of $500,000 a housing company could buy a tract of say 100 acres within easy reach of the center of the city, and plan the construction of 500 houses at the rate of 2 per week and complete the operation in 5 years. Such a job, with standardized plans and continuous employment guaranteed to the men, could be carried on far more economically than any housing operation undertaken heretofore, and show a larger profit. Materials for a large contract, with deliveries extending over such a long period, could all be had from mill shipments, at a considerable reduction in cost. The ownership of capital by the company would enable them to discount their bills. Plumbing, plastering, electrical and other work, usually sublet, could be organized and carried out by the general contractor, and a small mill for the manufacture of trim and sash would produce still further economies.

It has been found that 90% of the plans of a house can be standardized and the exterior still be sufficiently varied by changes in the roof lines, in the size and position of the porches, and in the use of different wall coverings, so that the street does not have that monotony that is objected to in factory towns.

The delivery of 2 houses per week would make it possible to employ small gangs working continuously, without waste of time, each gang being assigned to one or two simple operations. For instance, on a job recently carried out by the writer's firm, a gang of 5 men were given one day to dig the cellar. They were followed the next day by a gang of 4 who were given half a day to erect forms for cellar walls; they were followed in the afternoon by a gang of 6 who concreted the cellar walls. They were followed by carpenters organized upon a definite plan:

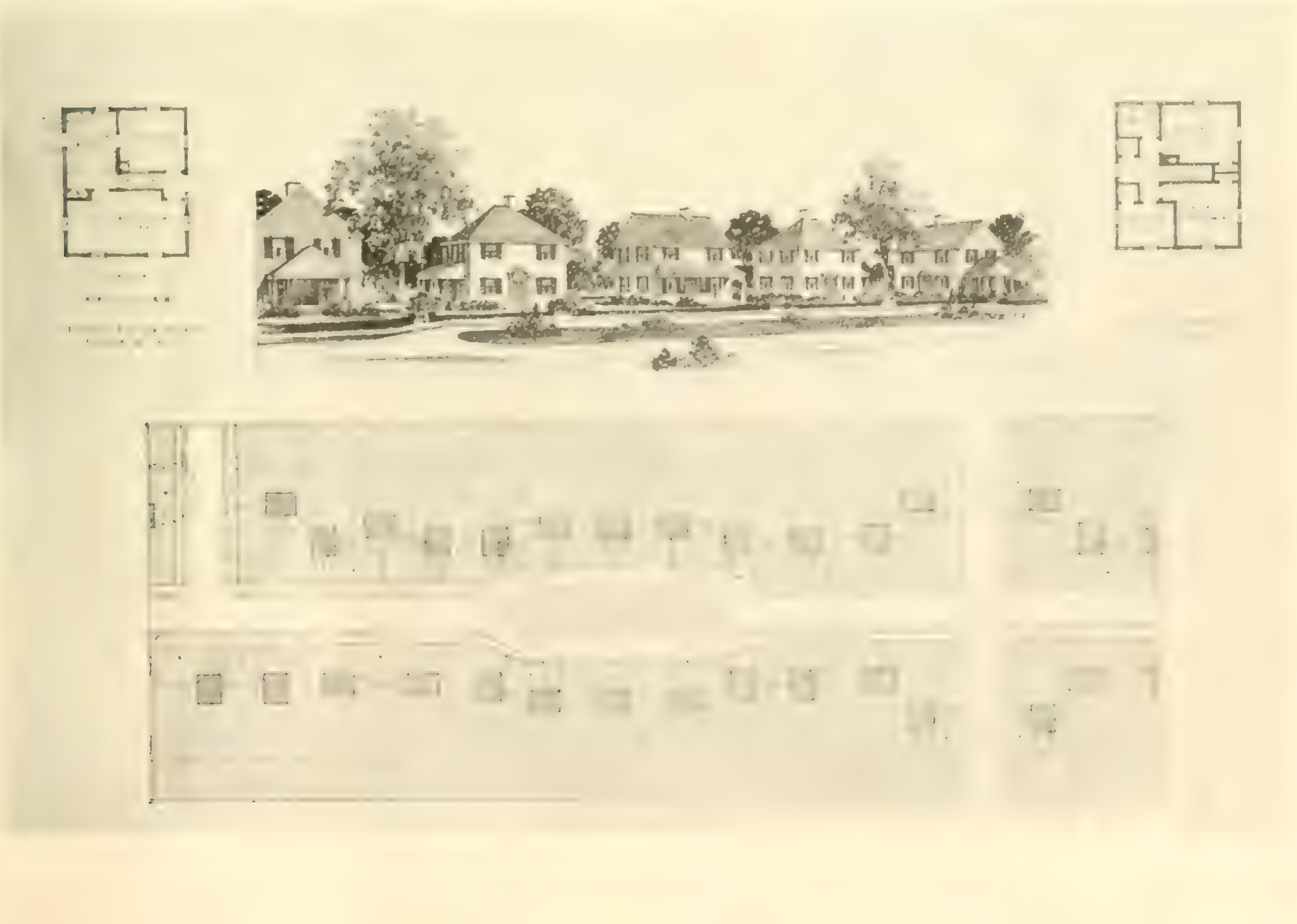
> One pair of carpenters had the placing of first floor joists and plates only.
>
> The next pair followed them, putting up the wall studs on every house.
>
> Another pair put in the second floor joists.
>
> Still another pair put on the rafters, and so on.

On the finishing of the house, it was one man's job to put in locks, another man's job to hang doors, and so on with other details. Each gang followed the others without waste of time or lost effort, and repeated the same operation day after day. The men soon got to the point where they could almost do their work with their eyes closed.

The operation of such an organization would begin to show its greatest economy after the first 6 months. It is reasonable to allow that time to perfect the running of the organization. It is not generally realized that the builder's organization on a small job is continually being re-arranged and he never has the opportunity that a factory superintendent has, to plan his work ahead for a year or more. His longest job usually lasts from 6 to 9 months, and then his organization has to be pulled apart and remade to fit the next, so that his men seldom work on the same job more than 2 or 3 months, and the character of the work they do varies from day to day.

The savings in purchasing material, the efficiency of men, and the economy of financing would reduce the cost of houses built in this way at least 20% so they could be sold at 10% profit and still be below the cost of houses built in the old way. There is no reason why the quality should not be the best in every respect.

The items of cost entering into the production of a house erected by a speculative builder may be roughly tabulated:



**This study of a street of standardized houses shows what can be done in the colonial style with one plan. The street is a well balanced composition instead of a hodge-podge. George F. Marlowe, architect**

| | |
|---|---|
| Material to be purchased, consisting of lumber, mason's material, hardware, etc. | $2,500 |
| Labor and furnishing material generally sublet, such as electrical work, plumbing, plastering, heating, etc. | 2,000 |
| Payroll | 2,000 |
| Discounts on construction loans, interest, etc. | 500 |
| Profit | 500 |
| Total | $7,500 |

The estimated savings under factory system of construction would be:

| | |
|---|---|
| 15% on items purchased at wholesale prices for mill delivery | $ 375 |
| 20% on labor efficiency | 400 |
| 15% subcontractors' overhead and profit, saved by doing the work with the company's own forces | 300 |
| Increased efficiency and better purchasing terms on subcontracts | 150 |
| Cash discounts, loan discounts and interest | 500 |
| Total (23% saving) | $1,725 |

A typical illustration has been worked out to demonstrate the profits obtainable in this way. The operation assumes the purchase of 100 acres of land, and the building of 500 houses during a period of 5 years. The same principles could be applied to longer or shorter operations and larger or smaller houses; the longer the job the greater the possibility of profit.

It is assumed that the 100 acres, near a car line and within reasonable distance from the city, could be purchased for about $150,000. Undoubtedly this land could be secured by a payment of $30,000 in cash, with a purchase money mortgage of $120,000 to be paid in installments as the houses were built and sold.

The type of building contemplated would be a 6-room house, which would cost, built singly, $6,000, but which could be built for less than $4,700 under the plan suggested. One hundred of these would cost $470,000. Adding for miscellaneous expenses, there would be a total expenditure, in a year, of nearly $600,000, but it is probable that with houses put on the market within 6 months of starting, enough cash would be coming in to keep the enterprise going with not more than $400,000 capital. It would be best, therefore, to issue shares upon which half was to be paid on allotment, and the balance on call if it were necessary. The cash required to carry on the job would be at least $350,000, as the first 6 months' operations would call for this amount before sales began, somewhat in this form:

| | |
|---|---|
| 1st payment on land | $ 30,000 |
| Interest on purchase money mortgage for 6 months | 3,600 |
| Initial expenses, cost of plans, surveys and miscellaneous expenses | 5,000 |
| Land improvements, roads, streets, grading, etc. (50 lots) | 20,000 |
| Cost of building 50 houses | 235,000 |
| Work in progress and inventory | 50,000 |
| Total | $343,600 |

A house of the type proposed should readily sell for $7,500. If offered for sale at $6,500 there should be a very brisk market, and it would still show a good profit on the basis of these valuations:

| | |
|---|---|
| Land | $ 400 |
| Improvements | 400 |
| House | 4,700 |
| Interest and overhead expense | 200 |
| | $5,700 |
| Profit | 800 |
| Total | $6,500 |

At the end of the first 6 months there should be 35 or 40 houses ready for sale, and from that time on the sale of completed houses at the rate of 2 per week should finance the operations of the company. The mortgage on the land would be paid off by installments as the houses and lots were sold. If at the end of the year the first 100 houses had been sold, there should be an operator's gross profit of $80,000 which is sufficient to pay 10% on the $500,000 capital invested and leave a substantial surplus to be carried over into the next year.

These are not large profits compared with those derived from many other manufacturing enterprises, but the figures will indicate that, given sufficient working capital, the housing enterprise ought to be reasonably profitable. Many city housing corporations are organized with a limited dividend of 5 or 6%, their main object being the promotion of the public good. There should be no difficulty in making such companies entirely successful, if organized on the plan laid down here, and kept strictly to the business of manufacturing and selling houses and not attempting to rush them.

The chief difficulty of the home building business has always been lack of capital. All of our talking, committee work, investigating, and any other efforts, can never produce the results that an adequate supply of capital would quickly do. Until capital comes to the aid of the housing shortage, we cannot improve our methods, reduce our costs, or see any relief ahead. As soon as the possibilities of profit have been demonstrated, and one or two companies are operating on the lines suggested, it is probable that the example will be followed in large cities all over the country.

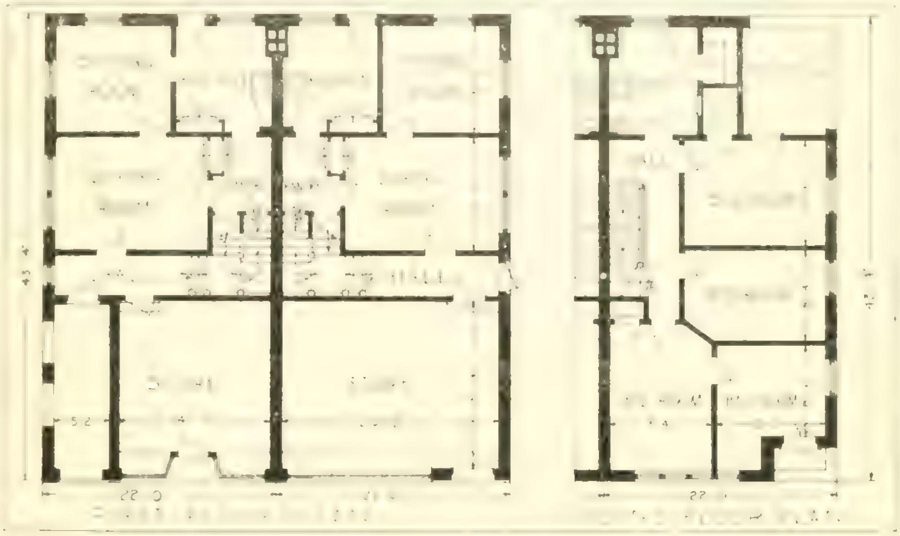
**Standardized semi-detached brick houses. Kilham & Hopkins, architects**

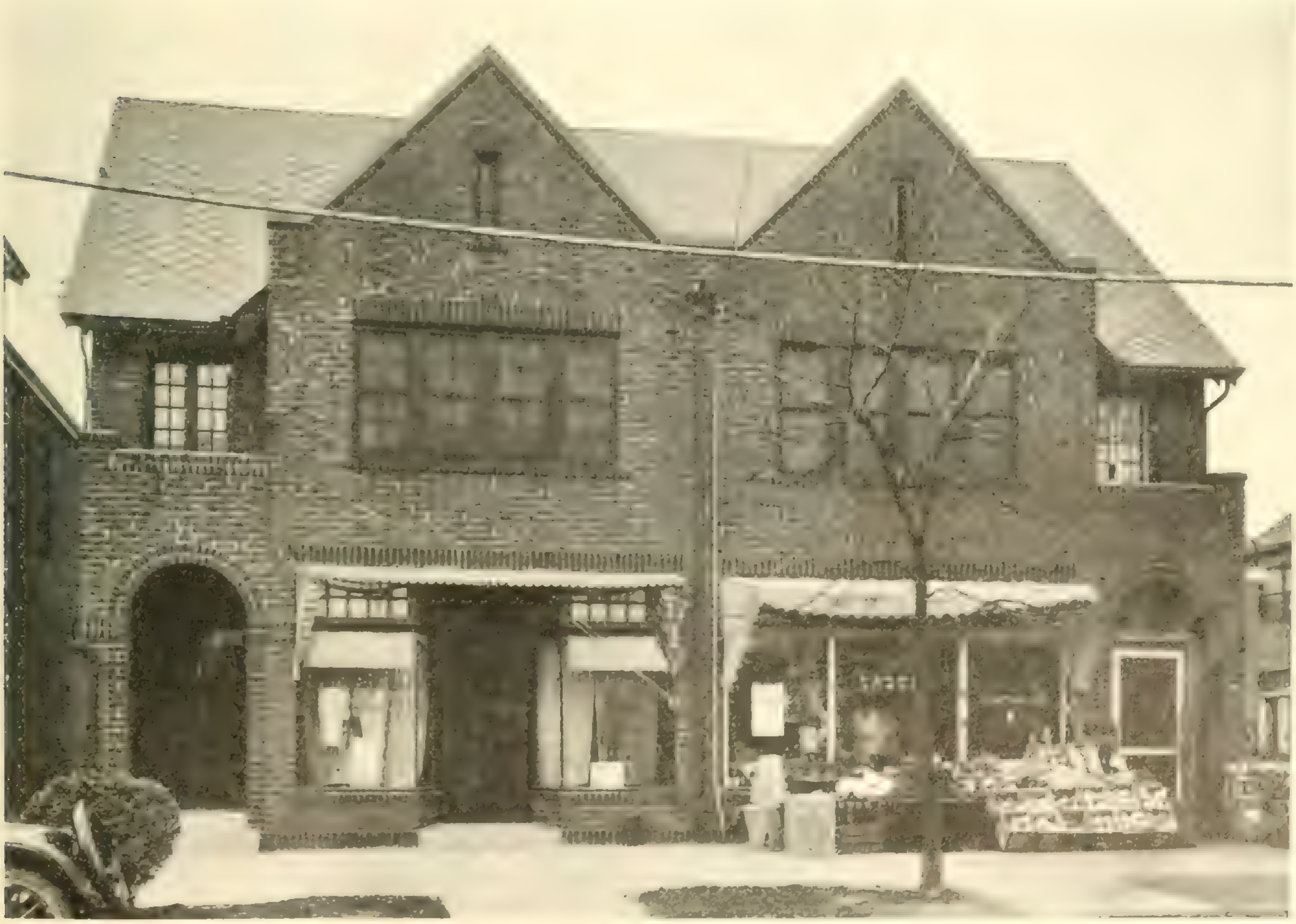
# Store and Flat Buildings

## In well selected locations these buildings show good returns to owners. Opportunities for builders are numerous

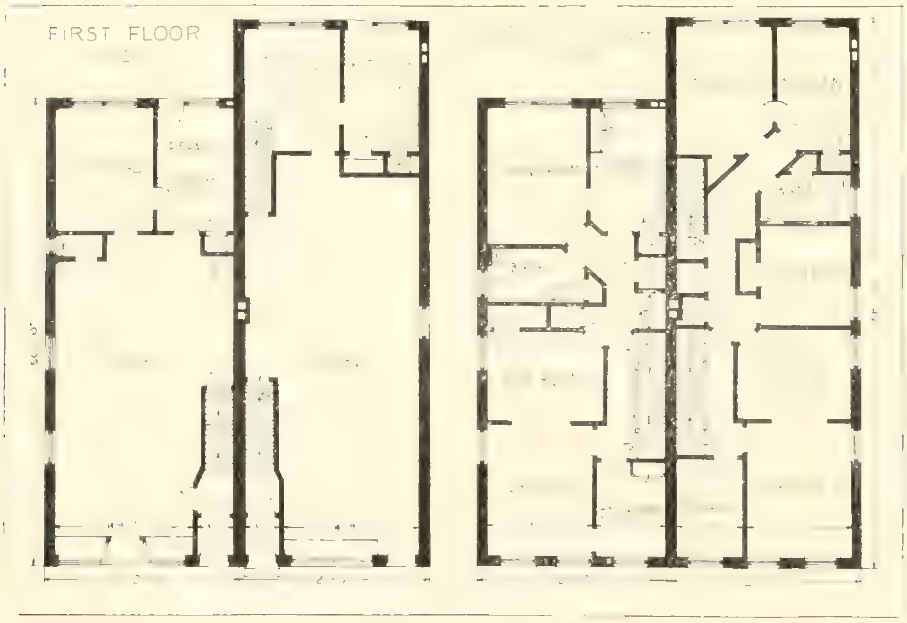
IN most small cities, and in towns both large and small, the store building is in frequent demand. There is perhaps no problem, among the many which come to the builder or contractor, which is generally given less consideration, and yet it would be hard to think of a type of building which can ordinarily do more to improve or to impair the appearance of the locality where it is placed.

In many instances the contractor or builder can be of immense help to the owner by pointing out the economic possibilities of the new building. The owner usually insists upon having a structure which can be built for as little as possible, and yet he wants it to bring in every cent of revenue which may be had, and right here is where the experienced builder, who is familiar with the local conditions, is in a position to give advice which will aid the owner in building wisely. Often the builder is able to point out the advisability of erecting a larger and more important structure than the owner originally had in mind.





A double group of stores and flats of good design at Forest Hills, N. Y. Upper floors planned for lodgings. Wm. S. Worrall, Jr., architect

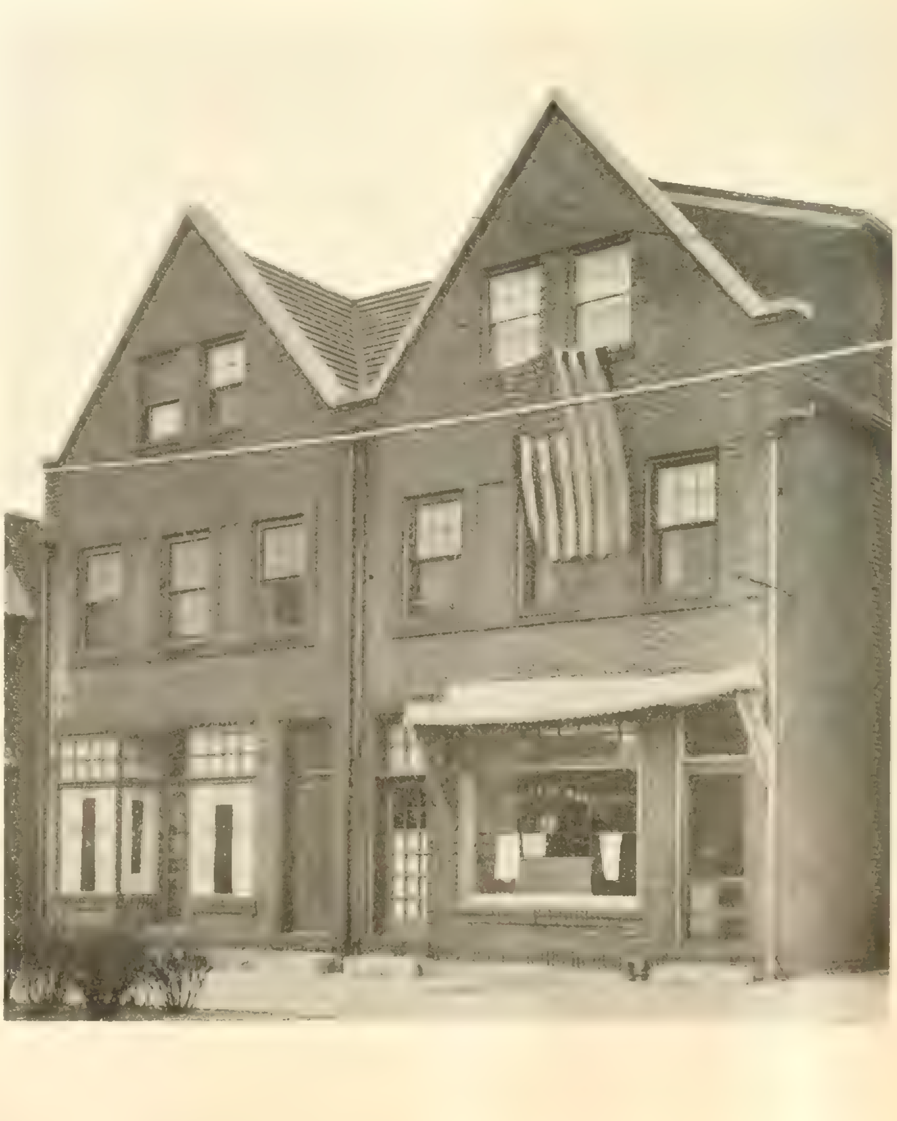


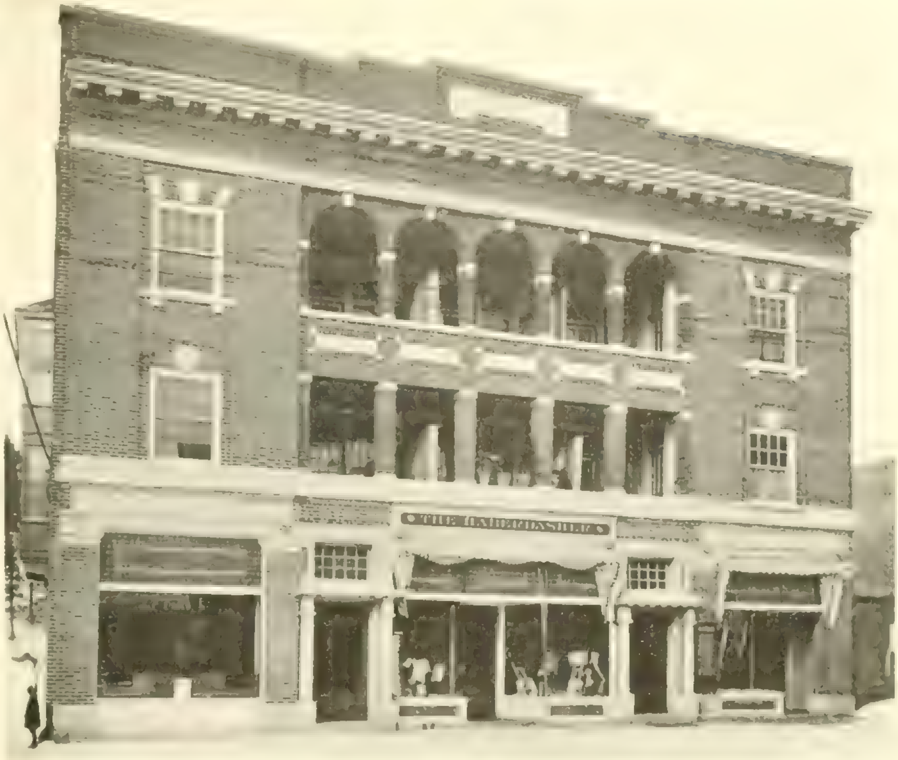
**A 2-unit store and flat building, one side planned for occupancy by one tenant, and the other by two. Bedrooms rented to lodgers. Wm. S. Worrall, Jr., architect**

As a rule, the 1-story building, which is devoted to one store, or to several stores, falls short of realizing the full possibilities of the proposition. It is easily rented, of course, and generally at a price which pays a fair return upon the investment after taxes, insurance and various other maintenance charges are paid, and yet in the average thriving community, if it had been 2 or 3 stories high, with offices or living quarters above, an increased revenue would have more than paid a larger return upon a greater investment. There must, however, be definite assurance of demand for the upper floors, because the carrying charges on such a building are naturally higher, and the owner cannot afford to wait for tenants. The local builders' knowledge of conditions will help him in giving advice regarding the sizes of the stores and of whatever offices or apartments there may be. The arrangement of the building will depend wholly upon the neighborhood; a community business center will need upper floor space for dentists, real estate men, etc.; a more residential section will call for small apartments; a junction point, through which there is much travel, would make some type of hotel or lodging house profitable. The builder who is looking ahead and anxious to promote work will consider possibilities for development in his town; a desirable piece of vacant land will suggest to him a building. With a fairly well developed scheme in mind, it is easy to interest an owner, and the result is often a good sized building contract and a well satisfied customer. The local real estate man should not be overlooked; his experience dovetails with the builder's, and these two can often combine forces advantageously.

The illustrations and floor plans included here give an idea of a number of buildings in which good design and economical arrangement of space are combined in structures which are distinct assets to the towns in which they are placed, and at the same time are good investments for their owners. On page 11 are shown two adjoining buildings, each of which contains a store of moderate size, with the remainder of the area within the building devoted to living quarters with a large number of bedrooms. This arrangement is adopted to meet a local condition. This building, and also that on page 12, are located near the railroad station in a fashionable suburb. Many unmarried chauffeurs are employed and it is necessary for them to find living quarters. The flats in these buildings are operated as lodgings, in some cases by the same people who conduct the stores.

The building on page 12 has more space given to stores. It is a group of two buildings with a party wall,

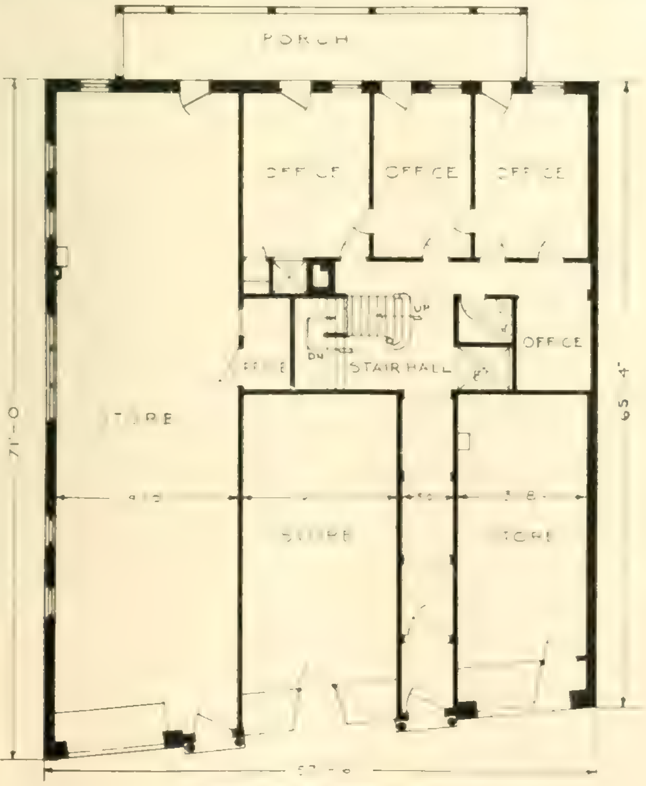




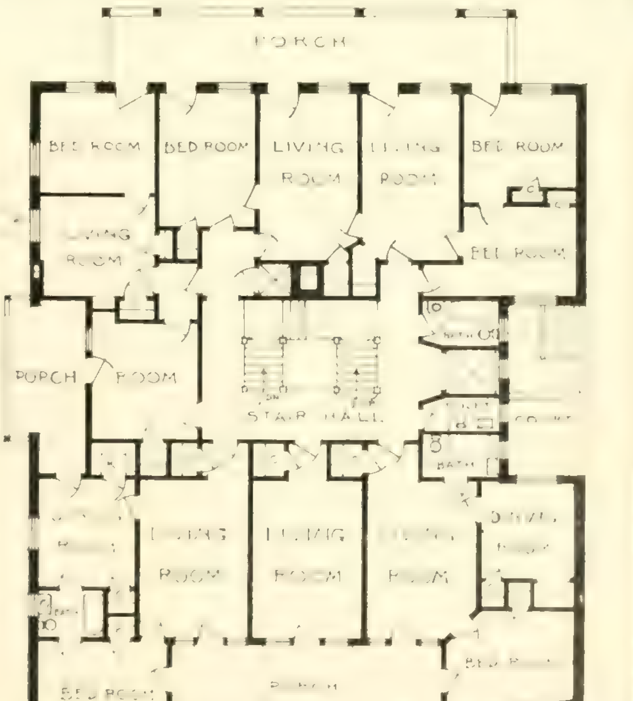
**An attractive store and apartment building at Saranac Lake, N. Y. The open loggias and porches are arranged for tubercular patients, this being a large center for their treatment.**
Scopes & Feustmann, architects

one of which could be built to serve the needs of a storekeeper with his living apartment above. The building at the left has a stairway to an upper apartment which is wholly disconnected from the shop below, while the structure to the right has a stairway directly from the street to the 6 rooms upon the upper floor, from which another stairway leads down to kitchen and dining room upon the lower floor. This arrangement calls for one tenant, in this case the upper floor being conducted as lodgings by the storekeeper's wife.

Page 13 shows a much larger building, with 3 stores and several offices upon the ground floor and an entrance, hallway and stairs to several living apartments of various sizes upon the floors above. The arrangement here is such that each of the apartments has its own porch, reached in several instances from the living room. Such apartments are generally in demand by small families. This building illustrates the type that may profitably be built where there are travelers or vacationists. It is operated as an apartment house for people who want short lease arrangements. Their stay is too long to make regular hotel life either comfortable or economical, and where such demand exists a building like this never wants a tenant. A study of the plans will show a variety of apartments, running from single rooms to 4 rooms with tiny kitchenettes. They are likewise arranged with communicating doors, as in hotels, so that varied groupings of rooms may be had to meet conditions.



FIRST FLOOR PLAN



SECOND AND THIRD FLOOR PLANS

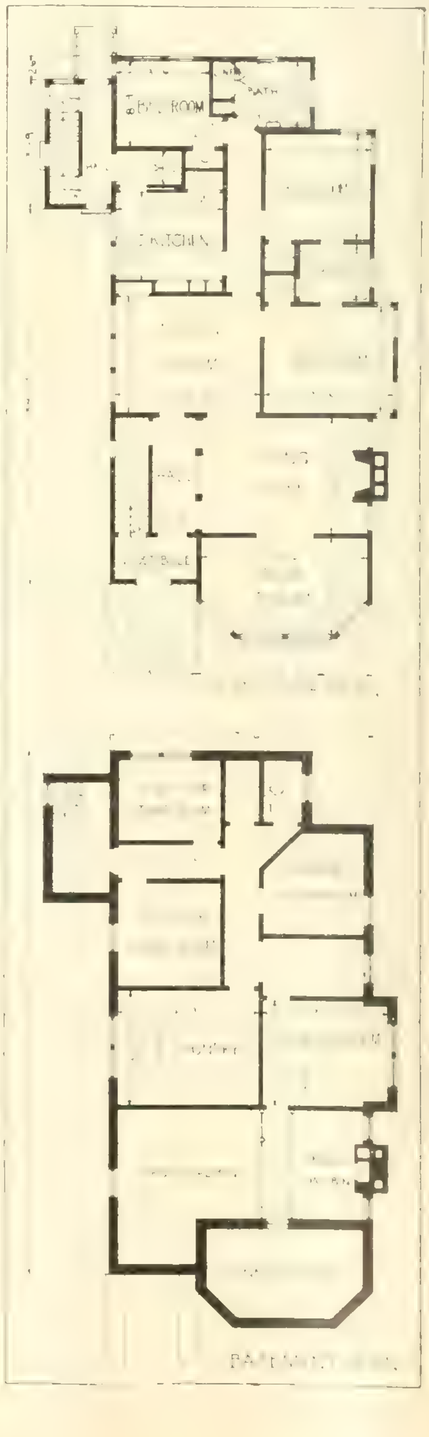
# A Two-Apartment House

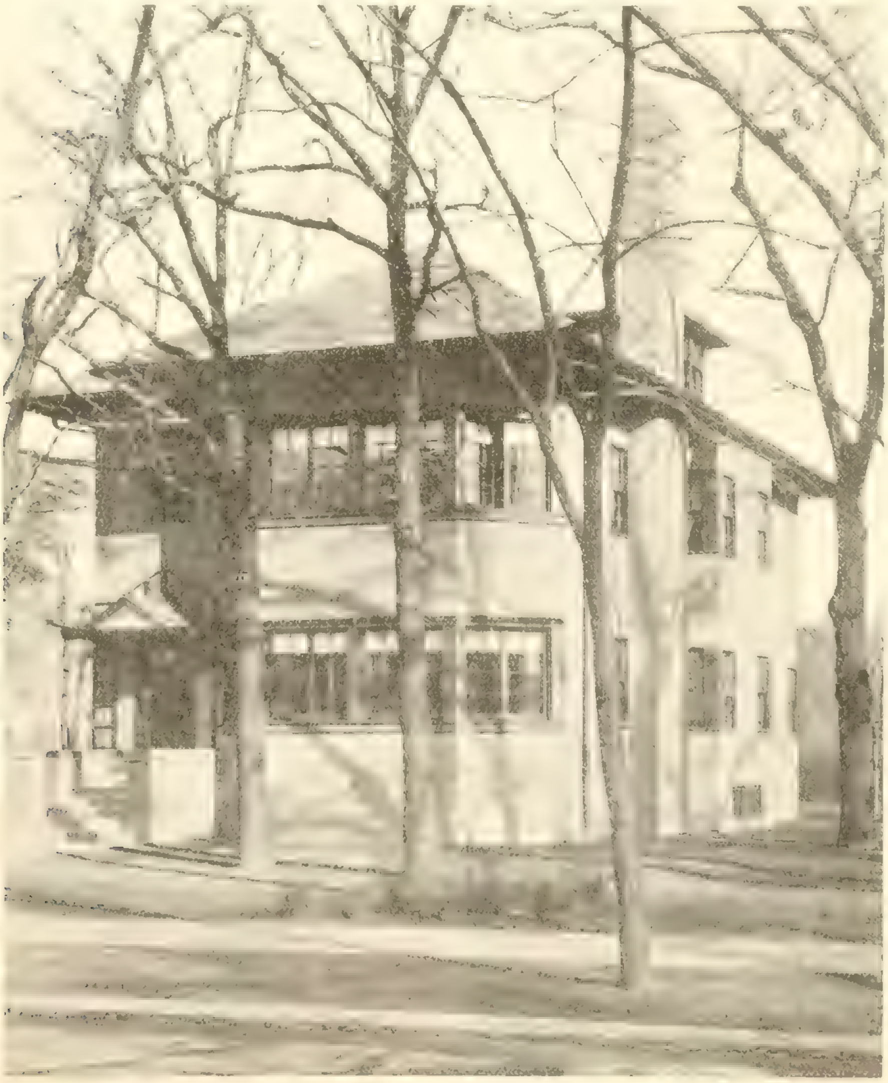
## This stucco house in a Chicago suburb shows how attractive the two-family house may be made

*Charles E. White, Architect*

THERE are many instances in suburban sections where restrictions regulate the building of residence structures, and where property owners are required to erect houses which conform to certain definite regulations. One of the restrictions almost always met is that which prohibits anything like what is generally-known as a "row house," by which is usually meant a structure having a finished front, but with unfinished brick sides and rear, the building of which, upon the average suburban street, would be apt to result in impairing the values of other property in the locality. In many cases, however, any objection which might exist to a 2-family house would be quickly overcome if the projected building were a well-designed structure, arranged for two families, but so skillfully planned that it would be thought an individual dwelling.

The illustration and plans upon this page show a house of this character, which is a distinct addition to a prominent Chicago suburb. The excellent appearance of the building is the result of wise use of appropriate material, and an entire absence of any undesirable ornament. Inside the vestibule there are two entrance doorways, one leading to each of the apartments, which are alike excepting for the details of their entrances and hallways. Each apartment has a fireplace and a large sun room, which is really an addition to the living room. The two bedrooms are arranged with a bathroom between them, with another bath next to a bedroom which, if desired, may be used by a maid. The building is heated from a single heating plant, which is cared for by a visiting janitor. The apartments are rented with heating furnished.





# Interpretation of Plans

## Part V. A study of lighting, plumbing, heating and ventilating details as indicated on plans

*By Victor D. Abel*

*Boyd, Abel & Gugert, Architects*

IT will perhaps help to a clearer understanding of the importance of plans which show the installation of the mechanical equipment in a building, if it is remembered that the work so indicated is the most modern development of present-day building. The laying of brick or stone, the fitting of doors, windows and other millwork, the plastering, the covering of the slate roof and the painting are all done by methods which have long been used and developed during hundreds of years. But the use of plumbing, heating and electrical equipment, so necessary to our comfort today, is comparatively modern. These details are not to be found in any building dating from even colonial days, yet today mechanical equipment is essential to our well-being, not only in the home, but also in many other buildings where it is the means of keeping at its high peak of efficiency the production of the world's factories.

Being so entirely different from the remainder of the work of the average building mechanic, there has been developed a new and separate trade for workers in each of these branches and devoted only to these highly specialized portions of the work. For that reason knowledge of them has been largely confined to the members of the trades working in these branches, and a lack of understanding of them and appreciation of their importance has often led to complications at the building and resulted in work being unnecessarily done over. A proper knowledge of the precautions which could easily be taken to co-ordinate the work of these different branches, through being able to understand the full meaning of the plans, would have obviated this difficulty.

There are certain of the more specialized portions of mechanical equipment which are not ordinarily involved in the course of building construction, and we shall not devote the time necessary to study plans for the installation of power and high pressure steam installations, sewage disposal and acid piping, sprinkler equipment for fire protection, and high tension electrical installations, power shafting for machinery, etc. These branches are so complicated that they should have the services of engineers skilled in such types of construction to lay out the work and to superintend its proper installation.

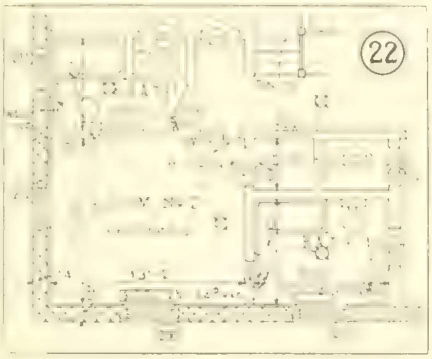


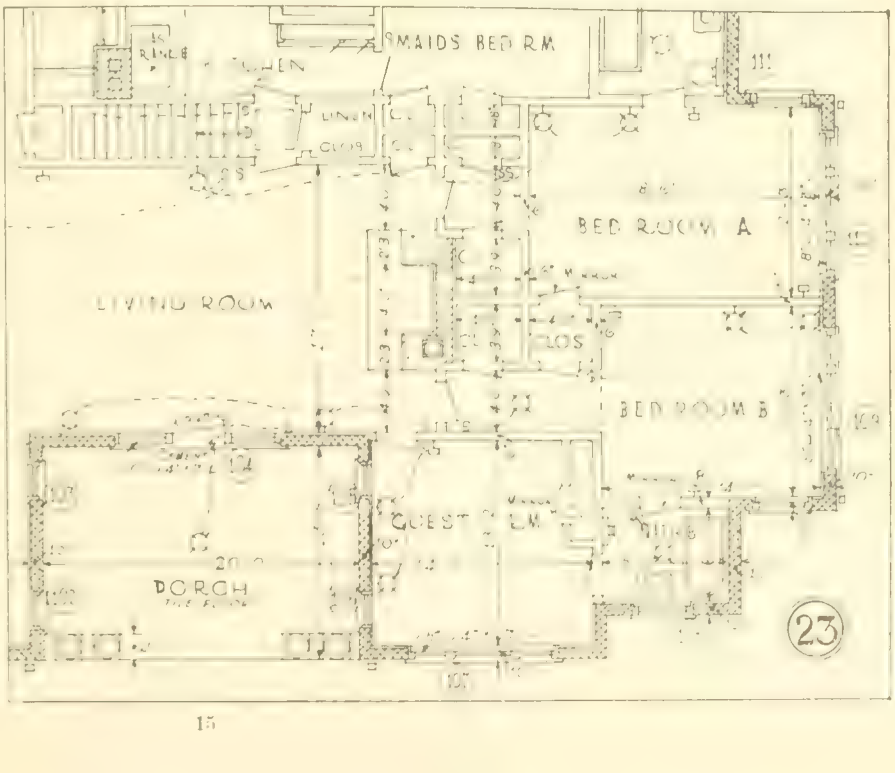
**Fig. 22. Portion of second floor plan, showing fixtures in bathrooms. Note different tubs**

In this article we will try only to make clear to the student the kind of plans, showing plumbing and different systems of heating and electrical installation, such as will usually be found. No attempt will be made to go into the details of workmanship or to give information as to assembling the materials, the running of pipes, trapping of fixtures, connections for piping, etc. That is properly a part of the work of each individual trade and cannot be gone into here. We can only assist in the reading of the actual data shown on the plans, whereon should be indicated, with the help of the specifications, the fixtures and arrangements or provisions for equipment which are to be included in the work of each branch. Therefore, only those details actually indicated will be noted, as this, and not actual supervision, is necessary for the complete understanding of a plan.

### Plumbing

Unless special drain systems, sewage disposal plans or complicated supplies are required, the necessary

**Fig. 23. Part of bungalow plan. Attention is called to indications of bath-room fixtures, gas range, and also rain conductors**



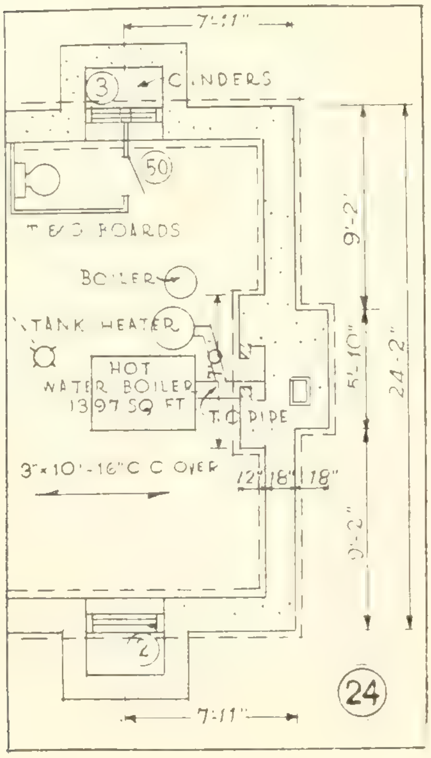


**Fig. 24. Basement plan having water closet, heating plant and water heater**

information regarding the plumbing to be installed in a building is usually shown right on the contract drawings. The work is indicated chiefly by giving the locations of the exposed fixtures to which water, hot or cold, is to be run and from which the waste is to be conducted to the sewer. By examination of the plans which have been previously illustrated in these articles, it will be found that on practically all of them is some indication of a plumbing fixture or outlet, showing that piping of some kind is necessary.

In connection with the location of fixtures on the plans, the student should refer to the indications in Part II, in the February number, and familiarize himself again with the proper method of showing floor drains, water closets, bath tubs, basins and the many other fixtures used in plumbing. It must be remembered that the drawings cannot express by these indications the quality of the fixtures or the grade of workmanship involved, and this is usually to be found fully set forth in the specifications, as will be made clear in the next and last article of this series.

The importance of the incidental work called for by the locations of the plumbing fixtures on a drawing must not, however, be overlooked, and while it may be gone into in the specifications to the fullest extent possible, the arrangement of the fixtures on the plan is often the only information to be obtained. For instance, in the case of the use of a built-in bath, the floor and walls of tiles, or any other material, must be arranged accordingly, whereas if the tub were free standing, a different method of installing the tub would obtain. These points we will not have the space to explain more fully, but they should be understood and borne in mind by every good mechanic. It is only to make clear the meaning of the indications on the plans that they are mentioned here at all. Again, where tile floor and walls are called for, the wood joists, if wood is the construction, must be prepared with a rough floor between the joists, properly supported and ready to receive the rough concrete base for the setting of the tub and the tile. If wood or composition floor is used, the arrangement of the work would differ.

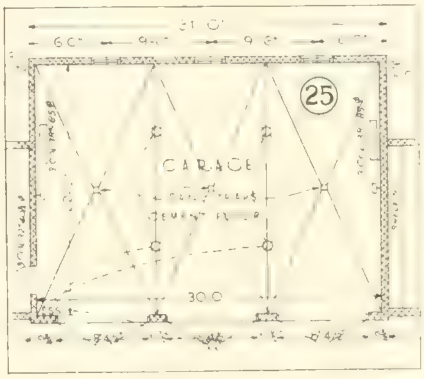


**Fig. 25. Garage plan, showing sand floor traps and rain conductors on rear wall**

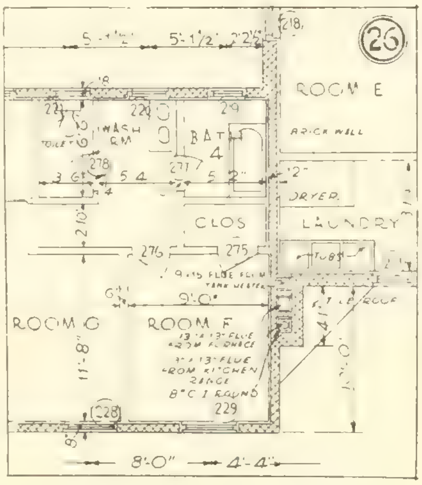
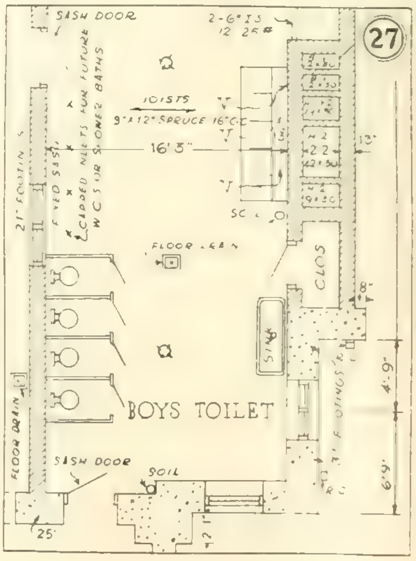


**Fig. 26. An unusual arrangement of plumbing fixtures, each in a separate room**

Turning to Fig. 22, part of the second floor plan of a house of hollow tile, there are 2 bathrooms shown, each with 3 fixtures. The tub in bathroom 1 is shown as a "corner built-in," while that in bathroom 2 is a "full built-in" or "recessed tub," as it is sometimes termed. This particular portion of the plan shows no other exposed plumbing, but, as the fixtures are indicated by their locations, the necessary rough and finished piping to make a complete installation must be included.

This plan, and also Fig. 23, illustrate the usual method of indicating the plumbing in a house as supplemented by giving the sizes of pipes, kinds of fixtures and qualities of workmanship set forth in the specifications. Fig. 23 shows the greater portion of the floor plan of a large bungalow, with bathroom B shown at the lower right hand corner. This indicates the usual 3 fixtures in the bathroom, with the tub free standing. In the upper part of the plan is shown the gas range in the kitchen, and this immediately calls attention to the location to which the plumber is expected to carry his gas supply pipes. Note also the rain conductors shown on the corners of the building, with the consequent work which they involve. Fig. 24, a portion of the basement plan of the house in Fig. 22, shows a water closet enclosed by a tongued and grooved board partition. It also shows the locations of the heater and boiler and the hot water boiler. This indicates the positions to which the various pipes for water supply are to be run, as

**Fig. 27. Details of plumbing in a boys' toilet room showing fixtures and provision for future installation**

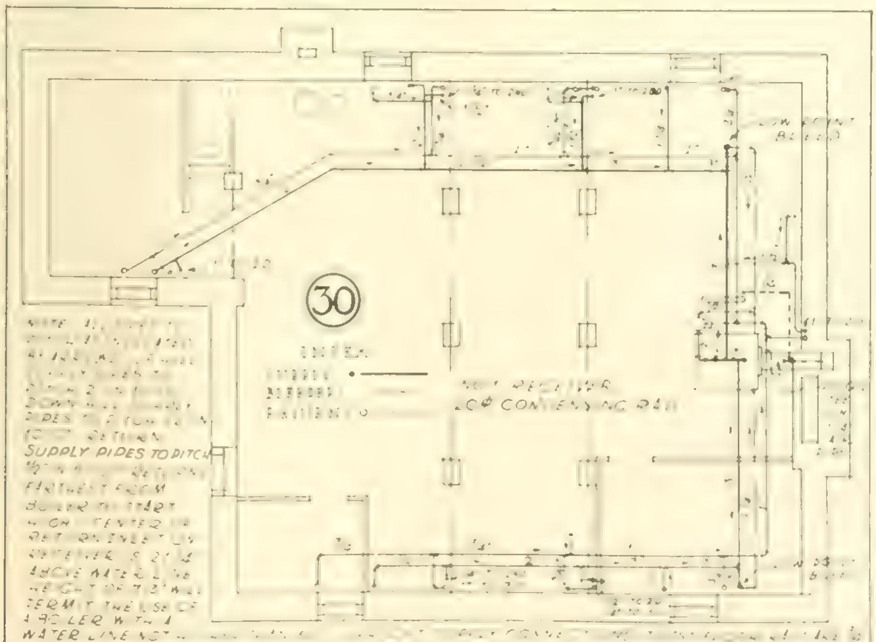


will be more fully set forth in the specifications. Note that the tank heater is shown to have the smoke pipe run into the smoke pipe of the heating boiler of the main house. This is often done because of the economy gained by saving an additional flue in the chimney.

The portion of a garage shown in Fig. 25 does not indicate much plumbing, showing only the 3 sand traps in the main room, with the cement floor drained to them, and the locations of the rain conductors which are shown along the rear wall. Fig. 26 shows an unusual arrangement of plumbing fixtures, and it is included chiefly for that reason. Each of the fixtures is shown in a different room. The tub is a corner built-in tub and the basin is double. In addition there is a 3-part tray shown in the laundry.

The boys' toilet room in a fair sized school is shown in Fig. 27. There are 4 water closets indicated, each set in an enclosure, and provision is to be made by the plumber for 4 more at some future time, as is indicated by the outlets noted "capped inlets for future W. C's or shower baths." A floor drain is shown in the center of the room. The sink is a long basin with 1 drain in the center. A 5-part urinal is shown, vented where noted "V" into the vent space in the brick stack. Even the location of the soil pipe is shown, so that any error in its installation may be avoided. The rain conductors are also indicated as is evident from one on this plan.

Fig. 30. A basement plan showing layout of piping for a vapor heating system. Note the various runs from the boiler, with connections and risers. Arrows indicate the downward pitch of pipes for drainage



### Electrical Work

This portion of the mechanical equipment is also usually indicated on the working drawings in connection with the balance of the work, although sometimes it is later and separately laid out when all the necessary information has been obtained and the exact locations can be more fully determined. Necessarily, therefore, when the great amount of detailed matter which must be shown on a plan is taken into consideration, both the lack of space and the necessity of avoiding duplication of lines must be carefully studied by proper and careful draftsmanship. With the electrical work there is usually a "schedule" explaining the indication of the outlets, switches, number of lights, etc., such as is shown in Fig. 29, just above.

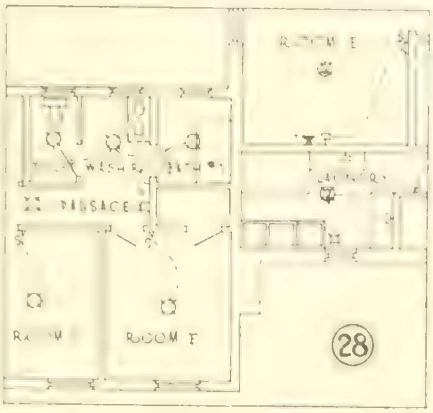


Fig. 28. Portion of separate electric layout drawing for building shown in Fig. 26

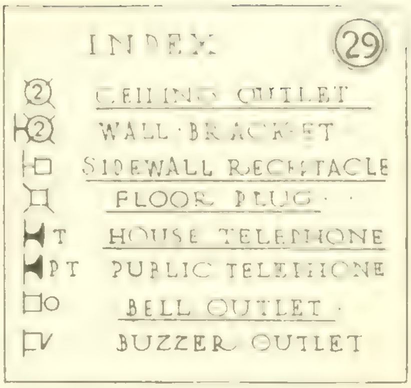


Fig. 29. This shows an electric lighting schedule, often furnished with drawings

Part II of this series of articles showed the standard system of symbols which have been adopted by the various associations interested in electrical development, and any separate schedules should conform to this system. The plans shown in this article do so conform, so that they may be taken as illustrating the method of reading them, whether a schedule is shown or not. By using these standard methods of indications in our study of the plans, we can then refer to Fig. 22, on which we will find a ceiling outlet shown in bedroom 2 and in the centers of both of the bathrooms. Each of these is controlled by a switch at the door to the room from the hall or bedroom. A floor receptacle or plug is noted in the bedroom at the partition next to bathroom 2. In the hall are shown 3 switches, one to control the light as shown on the plan in the hall itself, and the other two for lights on the first and third floors, as would be shown by the other plans if reproduced. It will be noted that the switches are in each case shown at the lock side of the entrance door to the room. This is the usual and proper location for them, because of convenience in turning on lights as a room is entered, and it is an unusual circumstance to cause them to be placed elsewhere.

Fig. 23 is a good example of the lighting shown on the plan of a large bungalow, placed directly on working drawings such as we have been previously studying. Note that both

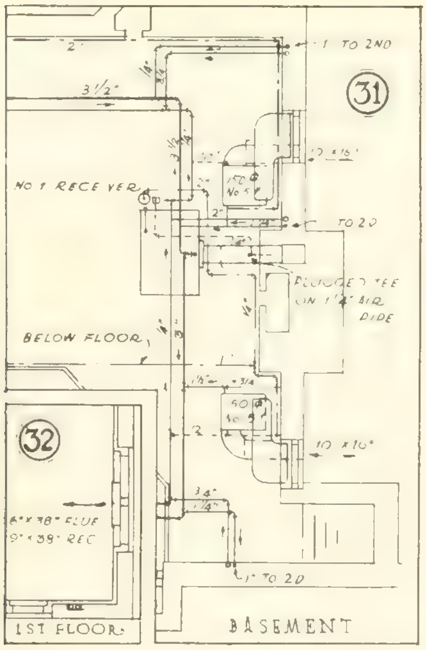


**Fig. 31 shows basement plan of direct-indirect system with radiators and ducts. Fig. 32 shows heat outlet on first floor**

ceiling lights and wall brackets, where shown, are controlled by switches. Both bedrooms and the living room have wall receptacles; there is no ceiling light in the living room, the lighting being entirely from side wall brackets, with a lamp attached to the receptacle. The garage in Fig. 25 is typical of the outlets required in this type of building. The main room has 3 switches, of which two each control two of the ceiling lights and the third the outside light in front of the middle door. There is also a receptacle at each end of the room, intended to be used with a cord for working around the car.

By looking back at the plan in Fig. 26, it will be noted that no electric outlets are shown, indicating that a separate plan was prepared for the electric lighting system of this particular building, this being one of the special cases previously mentioned. The portion of the electrical plan covering the same part of the building is shown in Fig. 28, so that both plans may be compared as to the reading of the data. Corresponding to this plan is the electric lighting schedule, Fig. 29, which is reproduced as an example.

Not all of the items included in this schedule occur on the portion of the plan shown in Fig. 28, and therefore those which are used are underlined for the convenience of the student. Using this schedule, the number and kinds of outlets to be installed can readily be seen. Calling attention to the more important details, note in room E that the ceiling light and the receptacle shown are each on a separate switch at the entrance door, and there is a house telephone indicated at one of the partitions. There is a bell shown in the passage. In the laundry are 1 ceiling light, 2 side wall receptacles and 1 floor plug.

Ordinary lighting in schools is generally much simpler than in other kinds of buildings, due to the fact that they are used almost exclusively in the daytime, unless in laboratories or rooms devoted to special studies. Fig. 27, the basement toilet room of a school, shows but 2 outlets in the ceiling. The control of these is not shown, and it is obvious that it must be looked for elsewhere; in this case it will probably be explained in the specifications.

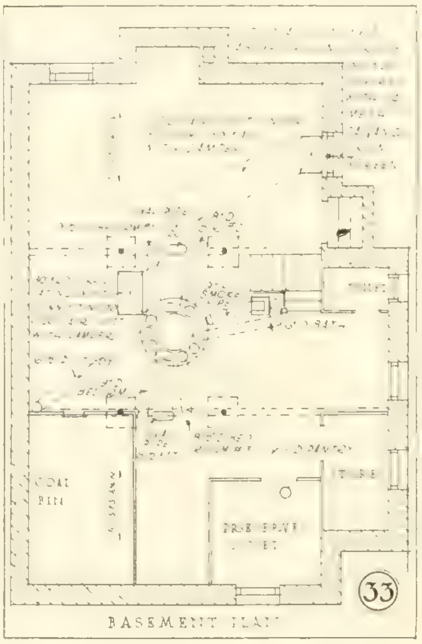


**Fig. 33. A basement plan showing layout for hot air system, with ducts and cold air inlet**

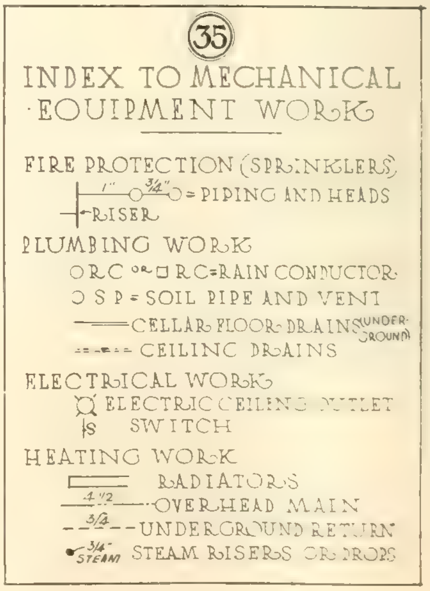
## Heating Equipment

There are so many forms of heating, such as hot water, one- and two-pipe steam systems, vapor, vacuum and vapor-vacuum, the direct-indirect forms of all of these, hot air by means of flues, the so-called pipeless heating, etc., that there can be no attempt to do more than to show the usual types and their indications. We will study, therefore, only the locations of the radiators, registers, heat outlets, boilers and other visible fixtures which must be provided for and, in certain plans, the locations of piping when shown.

As with plumbing and electrical work, the necessary data regarding heating is usually placed directly on the working drawings in conjunction with all of the other detailed information regarding the building, unless the use of a special system or unusual conditions of installation necessitate a separate plan. For the usual hot water or steam installation, the locations and sizes of radiators and boilers are all that are given on the drawings, the sizes and runs of piping being governed by standard good practice and the construction of the building. This is shown in Figs. 22 and 25, where the locations of radiators can be readily noted, and all have sizes marked. As an example, note the 2 radiators in the garage, each noted 3-col. 38″-85 sq. ft. Interpreted, this indicates a radiator 3 columns wide, 38 ins. high, and containing 85 sq. ft. of radiation, manufacturer's rating, taken from the catalog of the manufacturer producing the type of radiator noted. Fig. 24, the basement plan of a stone house, shows the location of the boiler and calls for its size to be 1397 sq. ft., manufacturer's rating. The smoke connection to a terra cotta flue, by means of the "T. C." pipe is also noted.

For the use of all the mechanics, other than those installing the heating, the information just given is

**Fig. 35. Index to indications for mechanical equipment shown on general plan on opposite page**


35
INDEX TO MECHANICAL EQUIPMENT WORK
FIRE PROTECTION (SPRINKLERS)
1" ¾" = PIPING AND HEADS
RISER
PLUMBING WORK
O R.C or □ R.C = RAIN CONDUCTOR
O S P = SOIL PIPE AND VENT
CELLAR FLOOR DRAINS UNDER GROUND
CEILING DRAINS
ELECTRICAL WORK
ELECTRIC CEILING OUTLET
S SWITCH
HEATING WORK
RADIATORS
4½ OVERHEAD MAIN
3½ UNDERGROUND RETURN
¾" STEAM STEAM RISERS OR DROPS

about all that they need have in order that their work will not conflict. The sizes and arrangements of the piping and other specialties and details in connection with the heating are properly a part of the heating mechanics' work. For the information of the steam fitters, as they are called, and for the benefit of other workmen who are interested in more than superficial knowledge, several plans of special systems are presented and explained. Such a separate plan is that shown in Fig. 30. This is the basement plan of a vapor heating system, showing the location and size of boiler and the sizes, locations and directions of the runs of the piping, with connections, etc. The directions in which the arrows along the piping are pointing indicate the directions of the downward pitch of the pipes, so as to drain the condensation of water.

The index with this plan indicates which pipes are supply, bleeder or return pipes, and the notes refer to the connections, amount of slope in the pipes and other essential data. The index shows that supply risers are indicated by solid dots and returns by open circles, and with this information, they can be noted on the plans, indicating vertical piping to or from radiators above. It so happens that this is a 2-pipe system, with supply and return pipes to each radiator.

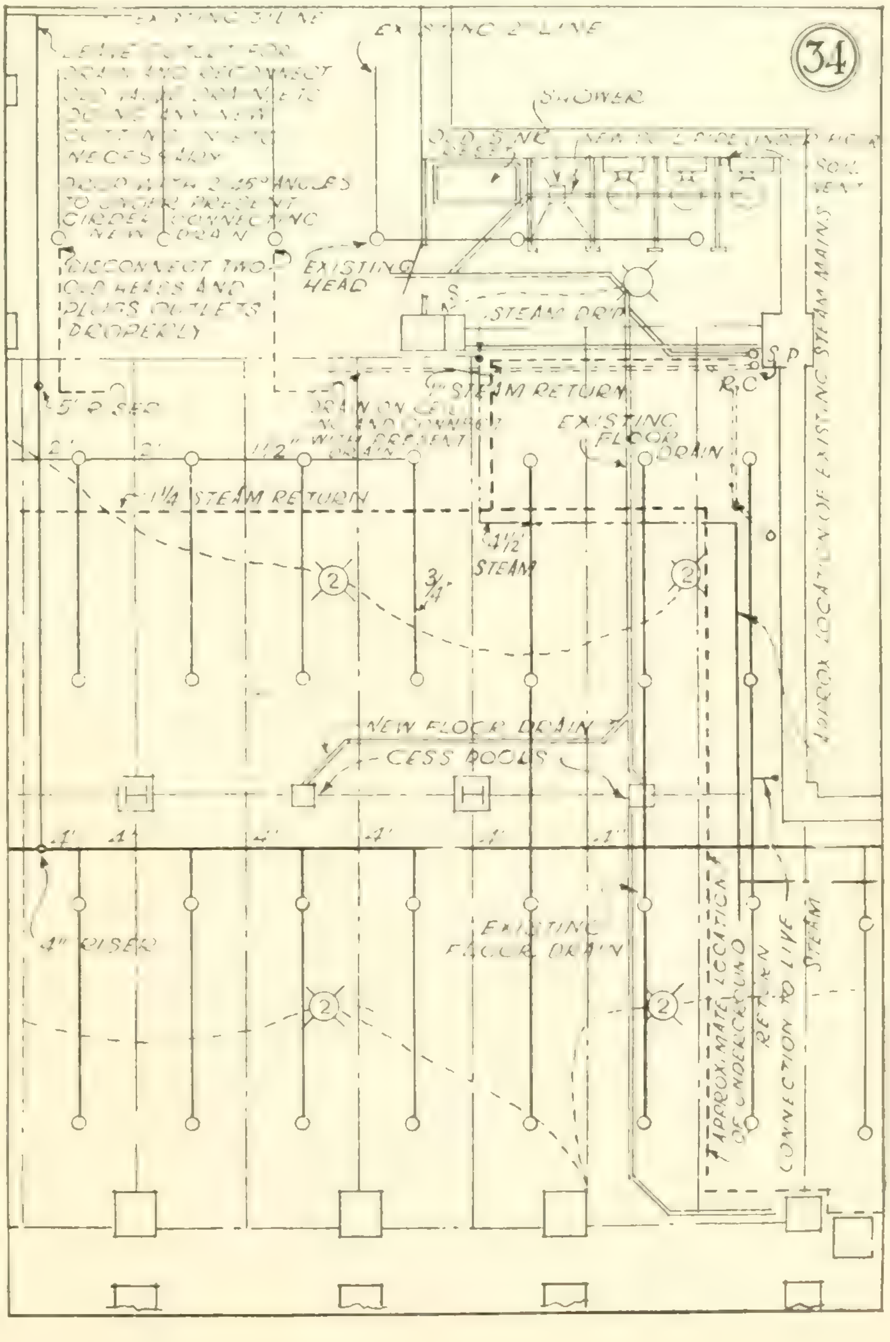
In some forms of heating, where economy is not absolutely essential, heating is sometimes accomplished by means of heated air passing over radiators. This is what is known as direct-indirect, the air being conducted from the outside, through galvanized iron flues, over the radiators, to be warmed to the proper temperature and then forced into the room to be heated. This is the form of heating often used for modern schools and in drying rooms of factories, although in such cases the installations are much more complicated than the example here shown. With this form of heating, any of the systems using radiators, hot water, steam, vapor, etc., may be used.

A simple and typical indication of an installation of this kind is shown in the basement and first floor plans in Figs. 31 and 32. The former is the basement plan showing the arrangement of boiler, piping, etc., as explained in connection with Fig. 30. In addition thereto, however, there are shown radiators hung on the basement ceiling, technically termed "benches," with a rating of 150 sq. ft. These are located at the 2 windows near the chimney. Lines are shown around the radiators, leading to the windows; these indicate the ducts for the fresh air to the radiators and are continued into the spaces to be provided in the walls, so that they may continue to the room above. As indicated by the arrow, the inlet for the fresh air is to be 10" x 16".

The continuation of the system is shown on the first floor plan, Fig. 32, where the line and arrow point what is to be the outlet for the heat. The size of the galvanized iron flue is here given as 6" x 38", which is the area of the duct for the warmed air leading from the radiator, and the register opening into the room at the end of the flue is noted as 9" x 38". Wherever we have mentioned materials, these have been called for in the specifications, as will be shown in the next article.

The indications of this form of heating, while they may seem complicated, are comparatively simple when analyzed and studied, but it has proved to be one of the most difficult of the matters to keep thoroughly straightened out at a building during erection. Through lack of understanding, it has not been at

Fig. 34. Plan of addition to a factory building, showing indications for **various mechanical equipment. Various lines of piping are shown by symbols explained in schedule in Fig. 35**



all unusual for other mechanics to place their details of equipment directly where the ducts, benches or registers are to occur, in spite of their being carefully shown on the plans, and this, of course, has made it necessary that the contractor, whose men were unconsciously at fault, be forced to pay for the removal and replacement of such work.

In Fig. 33 is given a basement plan, showing the layout of a hot air system. This is much simpler, although somewhat on the order of the direct-indirect heating, the principle of securing heat by means of warmed fresh air being the same. The location of the heater is clearly shown, and the double lines leading from it indicate the warm air pipes which conduct the heated air to the various rooms and spaces above. In framing the construction of the building, and in the other usual work of all the trades, the ducts can be readily avoided if the workmen become familiar with their sizes and arrangement as drawn.

So far we have dealt separately with each portion of the mechanical equipment. This article, however, would not be complete without several examples of plans developed entirely to show nothing but the mechanical equipment in certain types of buildings. These plans are for general information, except for the particular trades the work of which is shown thereon, but a knowledge of the essentials called for should be within the power of all mechanics to obtain, so that, as once before set forth, the work of construction may proceed without friction. Such a plan is that shown in Fig. 34, which, accompanied by the index in Fig. 35, indicates the fire protection (sprinklers), plumbing, electrical and heating work. This forms a highly instructive layout for our purpose, being typical of modern factory installations, and showing, as it does, the various branches carefully laid out to avoid conflict with each other.

It so happens that Fig. 34 is the plan of a building which is an addition to another already existing, and therefore all of this work must be properly joined to the work already in place. All existing risers and mains for all branches are fully indicated and explained by notes. Attention is called to the method of indicating the sprinkler system, which not only shows the runs of piping, but also has all of the valves, tees, risers and the sizes of all of the various parts marked. The plumbing equipment in this building consists of the soil pipes and vents and the rain conductors, all of which are shown and noted. Also indicated are floor drains, both in the basement floor and in the story above. These are noted and the pipes leading to the drainage system are shown differently for the overhead and underground piping. Reference to the index, Fig. 35, will show this, and the runs of pipes can then be traced. In addition to all this, the heating and electrical work are fully drawn in accordance with the schedule, and all sizes, etc., as required are marked. The locations of radiators and of electric light outlets can be readily seen, for all of the work is indicated without confusion. This plan is well worthy of study, and is useful for applying the knowledge we have been trying to impart by arriving at a thorough understanding of the work set forth.

Fig. 36 is another and somewhat similar, but is a more simple example of a plan showing complete mechanical equipment, this time in a chemical laboratory. The heating work is easily read, as it shows only the locations of the radiators and their sizes, and in addition special steam outlets and drains shown in the oven room. Special plumbing is shown, there being gas and water outlets to be placed alternately over a bench. Soil pipe and rain conductor are also indicated. The sprinkler heads, with the necessary piping, are also shown, just as on Fig. 34, and in the oven room the heads are to be different, as indicated in the note, "Sprinkler Heads in Oven Room to be 289 deg." This represents the degree of heat in the room at which the water in the sprinkler pipe would be automatically turned on in case of fire.

In the electrical work the note, "C. D. Panel Board," in the balance room, indicates the location of the panel board for the center of distribution or point from which the wires for the electric outlets radiate. There are no special features to be called to attention, except perhaps that the switch in the balance room controls both the ceiling light and the receptacle, while the other receptacles are without switches, which is the usual method of installing them.

For another example of a plan showing the mechanical equipment in connection with the general work on the working drawings, turn to the house illustrated in this month's issue of The Builders' Journal. This is a rather simple indication, only the exposed fixtures with their locations, sizes, etc., being shown. With the complete working drawings before one, it will be noted how readily all of the important points in connection with each branch may be picked out and, while the building is under course of erection, how simple a matter it is for the mechanic to avoid them while installing his own work.

We have so far attempted to make clear to the student the various forms of indications which he will find on the drawings of the several types of buildings. With a knowledge of how to secure this information from the blue prints, the next step is obtaining the additional data needed during the construction of the building to acquaint the mechanic with the classes of materials and workmanship which are intended to be used in the construction of that building. This is shown by the specifications, which will be the subject of the next, and last, article upon this topic.

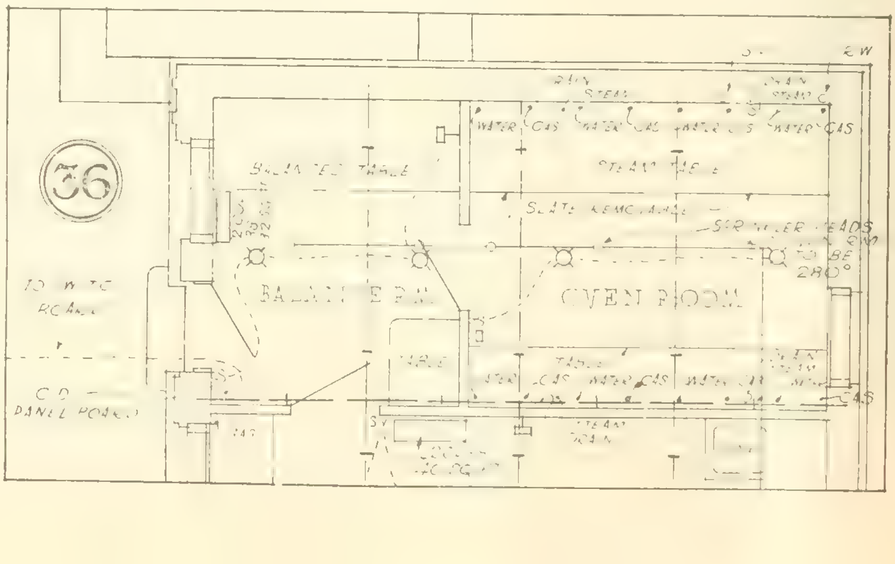


**Fig. 36. Part of chemical laboratory plan showing outlets for gas, water and similar equipment**

# Recent Housing in Brooklyn

## Interesting methods of arranging semi-detached dwellings and garages under restriction of high land values

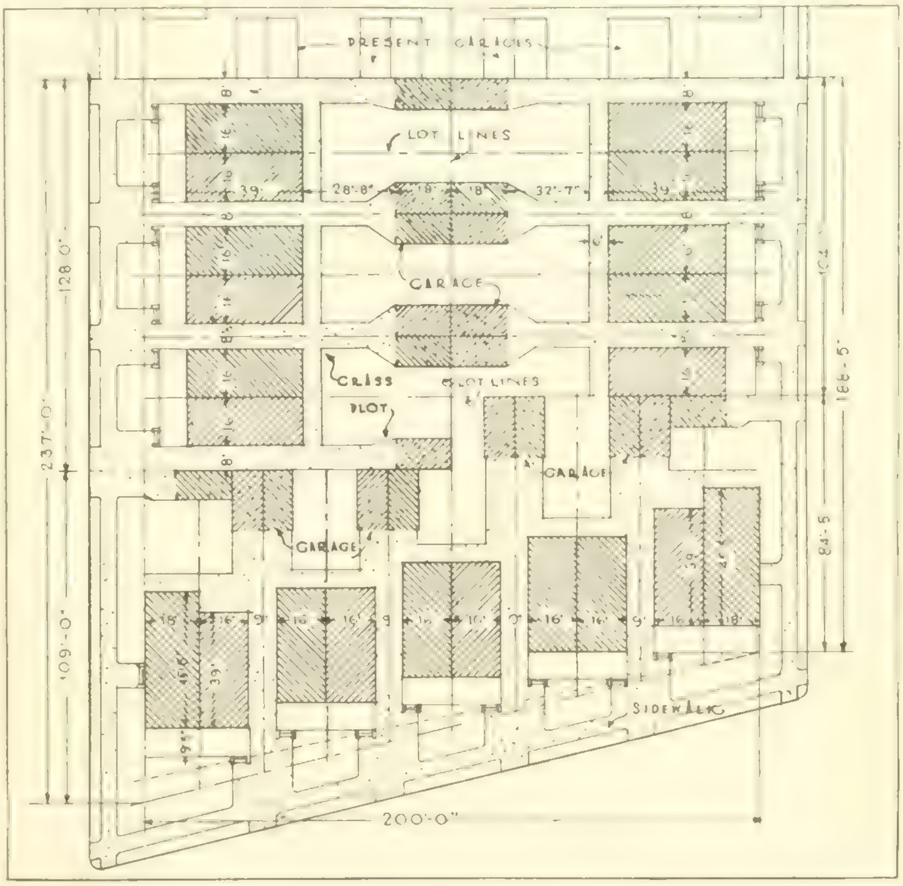
*Realty Associates, Developers; Benj. Drissler and Slee & Bryson, Architects*

ONE method of solving the problem of providing dwellings on land too high in value to permit of large plots, is shown in two developments, which have been carried out recently in the Eastern Parkway and Bay Ridge sections of Brooklyn, by a large organization known as the Realty Associates. This organization has been actively operating in New York for a number of years, and has had wide and successful experience in land development and speculative home building.

Usually, where comparatively high land values are involved, in outlying sections of large cities, the houses are planned in rows, with party walls. Several projects of this nature have been described in past issues of THE BUILDERS' JOURNAL. In these Brooklyn instances, however, while the owners found that they were limited to lot widths of from 20 to 22 ft., it was decided not to use the row type of housing, but to provide layouts of semi-detached houses, allowing driveways between the buildings to individual garages in the rear. Approximately 70 houses of this type have been built by the Realty Associates during the last few months from almost the same floor plans, but with different exteriors. Forty of these were constructed in the Bay Ridge district and 30 in the Eastern Parkway section. As these were separate improvements, with houses designed by different architects and built under different specifications, each group may be regarded as a separate operation.

### The Bay Ridge Development

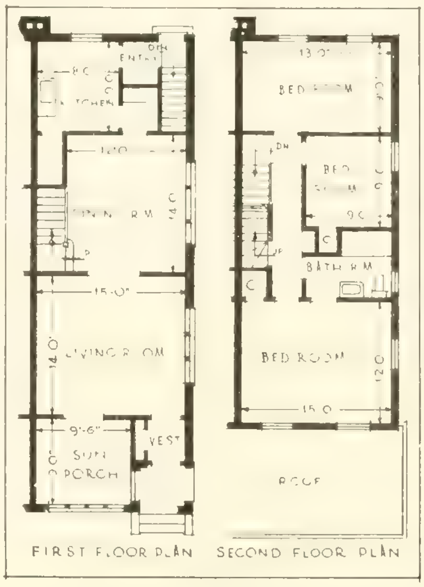
A study of the lot plan of this improvement will show that the first



Plot plan of a portion of the Bay Ridge development and, below, a street view of the same section before grading was completed

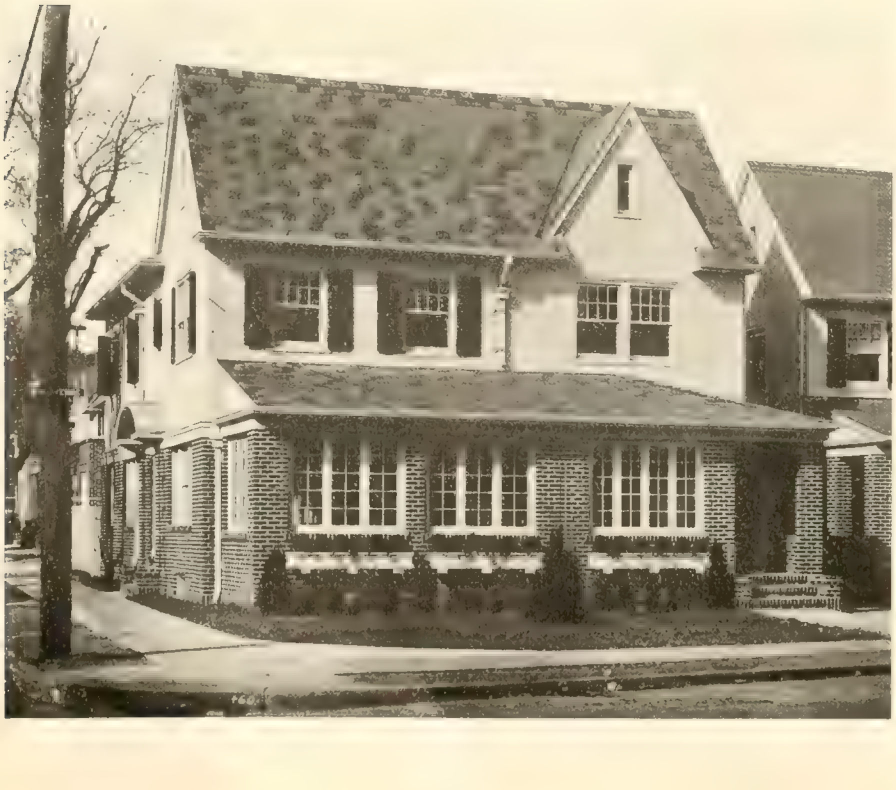
problem was the division of a square block of level land, on grade, into plots suitable for the building of semi-detached houses, with entrances to individual garages in the rear. The average single lot in this development is 20 ft. in width and approximately 100 ft. deep. Wherever possible, the garages themselves are of semi-detached type, which made possible some saving in the cost of construction. It will be noted, therefore, that an individual holding in this development consists of a 6-room, semi-detached dwelling, with a sun porch which provides an additional room, together with an individual garage at the rear of the lot, approached by a driveway which is used in common by two owners. One of the illustrations included here indicates the attractive method of laying out the back yards and drives, and the method of constructing the garages. It will be noticed, in this illustration, that some of the garage buildings contain 4 units to serve each of 4 dwellings.

These Bay Ridge houses, excepting the corner houses, are built upon the same floor plan. The exterior walls are of brick veneer and stucco. The roofs are of slate, and it may be noted that variation is obtained by the use of mottled gray slate on some of the houses and flat gray on others. The architect, Benjamin Drissler, has carefully studied this project to obtain attractive unity of mass in the entire block, and variation among the different units by the arrangement of dormers, window spaces and entrances. The sun parlors are enclosed in brick and glass, and good hardwood finish is used throughout, with parquet floors. Equipment in these houses includes steam heat, electric lights and tiled shower baths, and there are no dark corners, owing to the provision of ample spaces between the buildings. The first floor grade is set high enough above the street level to provide sufficient light for the cellars and, incidentally, to save in the cost of excavation. The foundations are of concrete; flashings are of copper. The garages are constructed of brick, tile and stucco.



Typical floor plans of one unit in Bay Ridge development. Benjamin Drissler, architect

Grouping of 2 houses on a corner lot, with entrances on separate streets. Note the use of materials to give color



The floor plans show careful study and economy of space. Entrance to each house is through a small vestibule directly into the living room, and the sun room becomes practically a separate room. If desired, for securing better light in the living room, the wall between the living room and the sun room could be omitted, the upper floor wall carried upon a girder, and 1 large room made of what is now the 2 rooms. The stairways of these houses, it will be noted, are placed in the dining rooms, and the kitchens, in many instances at least, open onto the driveways which are placed between the houses. The high pitched roofs, which aid in making the exteriors of these houses far more distinctive than is usually the case with moderate cost city residences, serve a highly important purpose in providing space which is useful for storage purposes and which may easily be made into 1 or 2 additional rooms. These added rooms are so often desired by purchasers that the owners and builders of the houses are prepared to make the necessary addition at a cost of $300 for 1 room, or $500 where 2 rooms are required; these rooms are simply finished, use being made of wall board. This possible enlarging of the houses adds much to their attractiveness as sales propositions, for a house which might be too small with 3 bedrooms appears in altogether a different light where, at an added cost of only $500, it contains 5. It is a feature which might, in many instances, be the means of making a sale.

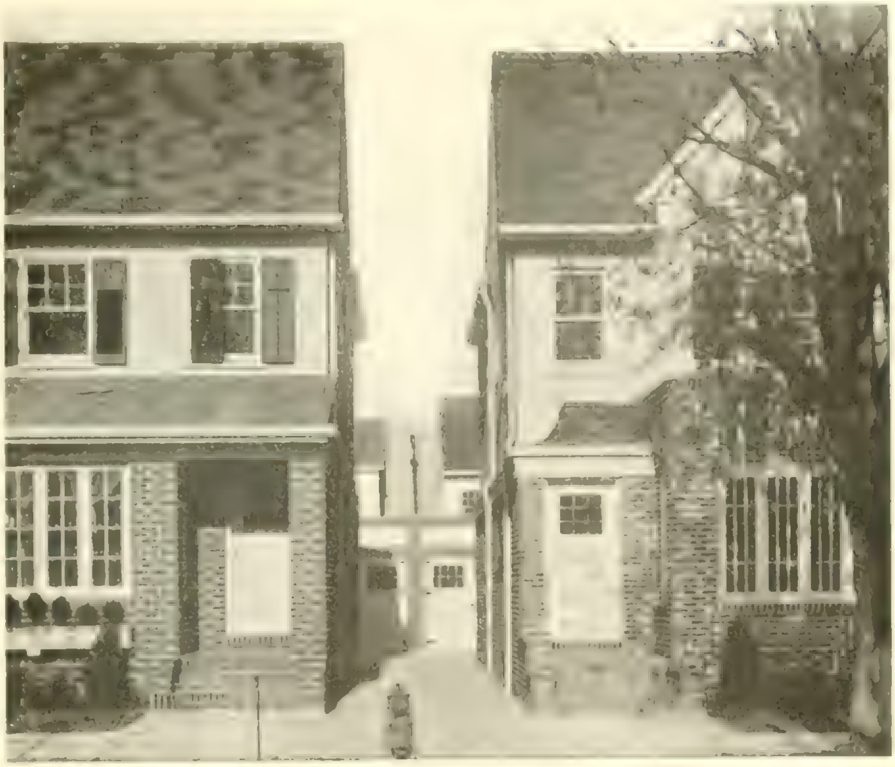
The houses in both these extensive developments are built entirely with the funds of the owning company, no mortgages of any kind being placed until they are entirely completed, when upon each of most of the houses a savings bank mortgage of $6,000 is obtained, these mortgages being assumed by the purchasers of the houses from the Realty Associates. The houses in the Bay Ridge section sell for from $14,000 to $15,500 on easy terms, as little as $2,000 cash being accepted, with payments of from $50 to $100 a month, over a term of 7 or 8 years, for amortizing the second mortgage. The corner houses in the group are sold at $19,000, being larger structures with 1 extra room, more land,

and other features which are possible on a corner plot.

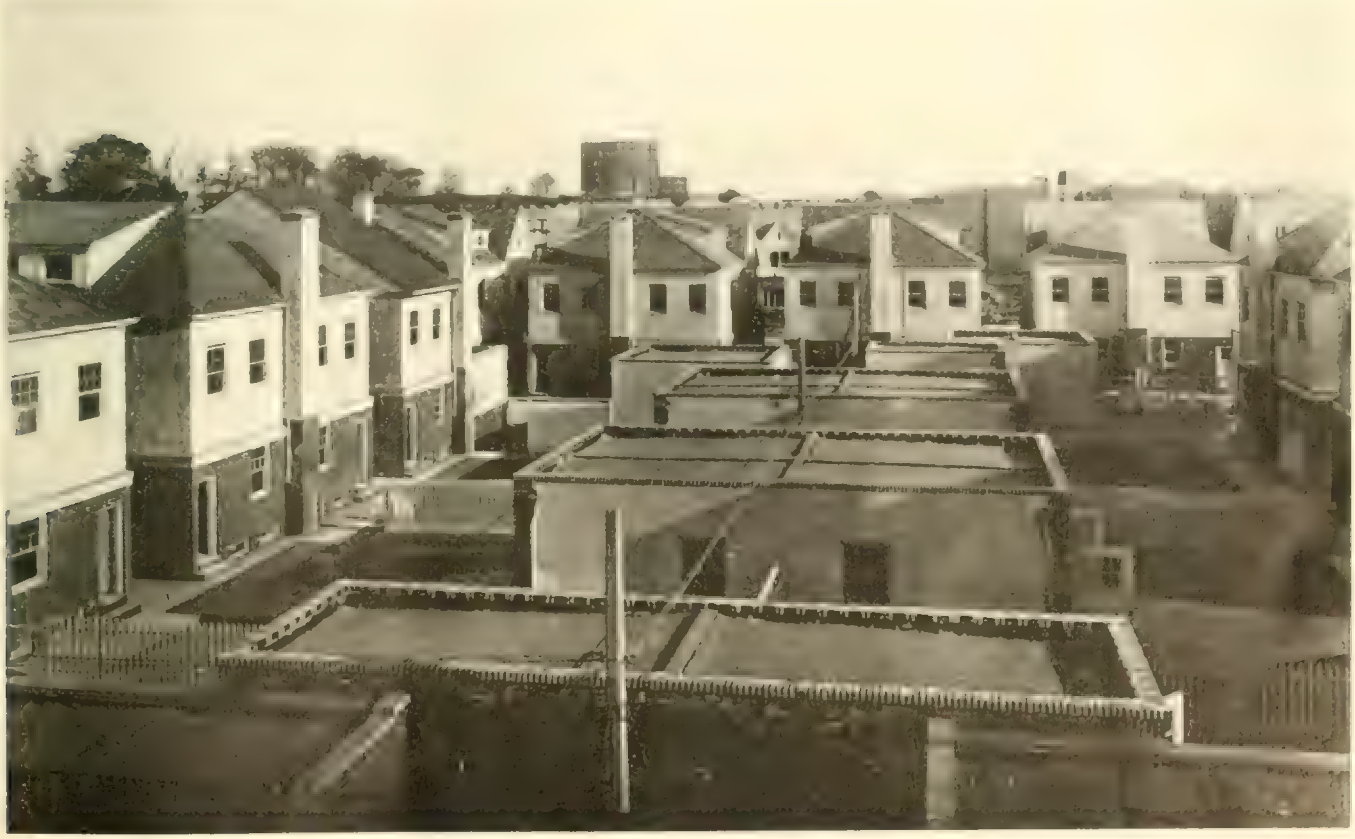
### The Eastern Parkway Improvement

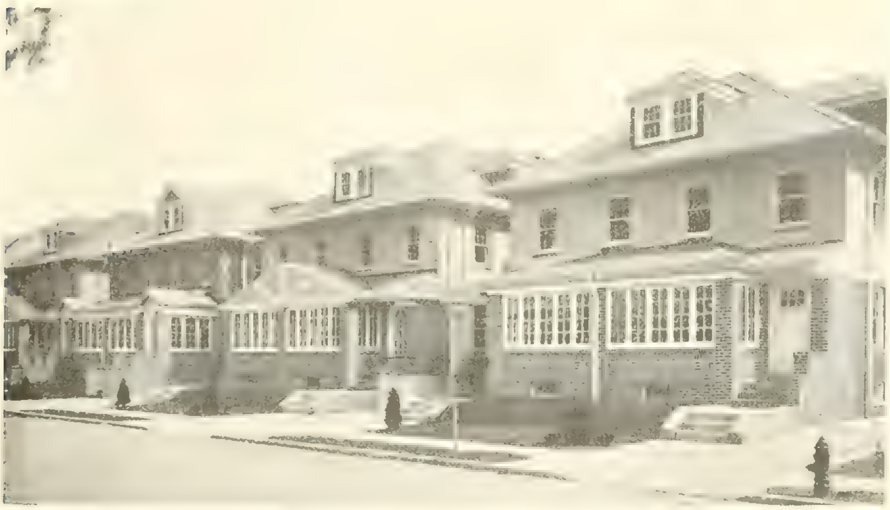
In this development there are 30 houses, also of the semi-detached type on lots approximately 22 x 100 as indicated upon the accompanying typical block plan. Here the general layout is similar to that of the Bay Ridge development. These houses were designed by Slee & Bryson, architects. They are somewhat larger than those in the Bay Ridge section, and contain rooms of larger dimensions throughout. The construction of the exterior walls is of solid brick, with surfacing of face brick and stucco. Roofs are constructed throughout of asbestos shingles. These are laid on solid tongued and grooved roofing boards on spruce timbers. The foundations are of solid concrete, and copper flashings are used. The construction throughout is unusually good, and the interior finish is equal to the average in much more expensive types of dwellings.

Prices at which these houses are sold vary from $15,700 to $16,750. The first mortgage, which is for $7,000, is held by a savings bank. Terms of purchase include the payment of $3,500 cash, and the payment of the second mortgage extends over a period of 7 or 8 years. It may be noted here that the houses in both of these developments are subject to the New York Tax-Exemption Ordinance, which has already been fully described in THE BUILDERS' JOURNAL, and which provides a saving of over $1,400 per house for the purchasers.



**Here are shown views of the garage arrangements. Each house has an individual garage, reached by a drive common to 2 houses as shown above. Below is a view from an upper story, showing layout of rear yards with grouped garages**

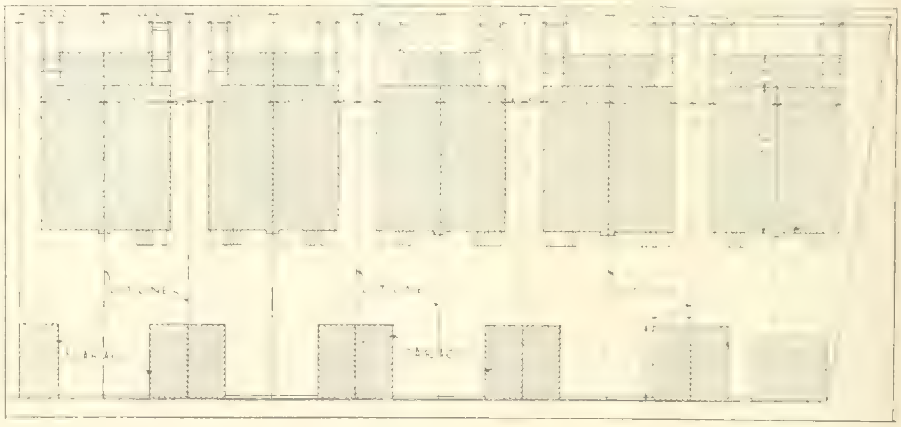




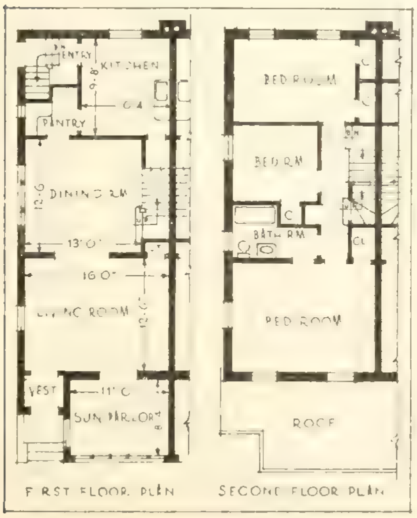
**Street view of double house in Eastern Parkway development. Entrances separated by sun porches. Slee & Bryson, architects**

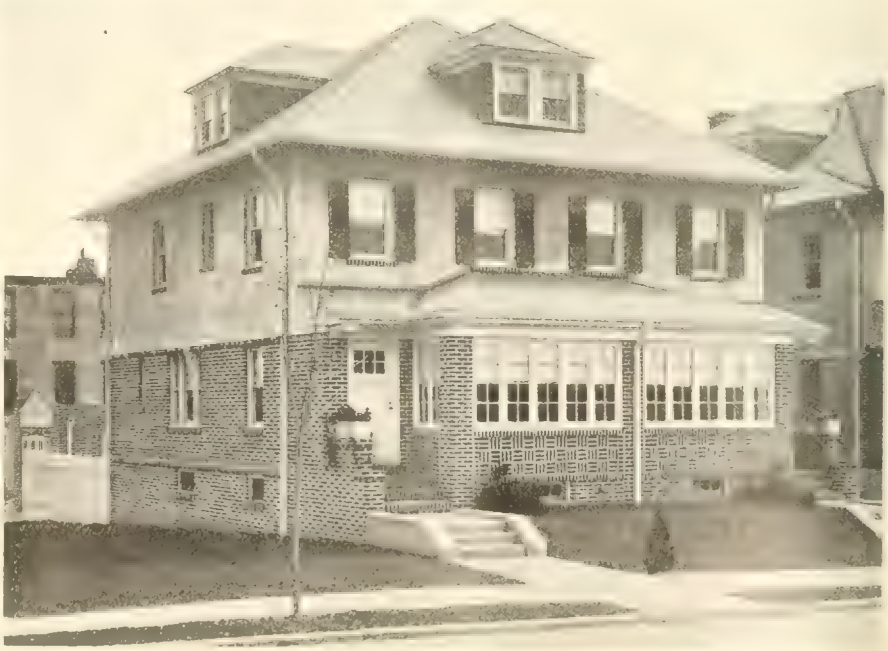
It is particularly interesting to note that all of these houses are placed on the market at prices actually lower than are being asked and obtained for poorly constructed dwellings of the same sizes in similar outlying sections of New York. This is partially due to the fact that the owners proceeded in a careful and systematic manner in the purchasing of all necessary materials. For instance, at a time when brick was being generally quoted in New York at $31 a thousand, they made purchases in barge load lots, in the Hudson River brick districts, at $19 per thousand. Similarly, they went as far south as Virginia for lumber in order to obtain every possible saving. The great saving which careful purchasing has made possible, in the construction of the houses in both of these Brooklyn developments, is being passed on to the individual purchasers of the houses in the form of added value for the same money which might be paid elsewhere.

It is particularly gratifying to find excellent construction of this nature carried out in a speculative building project at a time, and in a location, where the obvious temptation has been to build cheap, flimsy construction. At times builders who try honestly to serve the home-owning public, by building according to sound principles of construction and by selecting good standard materials and equipment, must be discouraged by lack of public appreciation. They may see the products of "fly by night" builders sold quickly and sometimes at prices almost equal to, or even greater than, those which need be paid for well built houses. It must be realized, however, that the public is slowly learning appreciation of better construction, and that in the long run speculative builders who really become "key men" in their communities, men bearing sound reputations and showing a steady growth of business, are those who follow the more reliable methods of construction and finance.



**Above is portion of plot plan showing lot arrangement; below, plans of individual house**





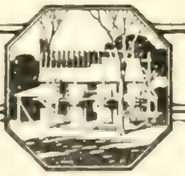
# THE BUILDERS' JOURNAL PLANS

A Series of Practical Designs for Small Houses
Published in Complete Working Blueprint
Form with Quantity Survey of Construction
Materials Needed for Estimating Purposes

### NUMBER FOURTEEN

## SEVEN-ROOM DUTCH COLONIAL HOUSE

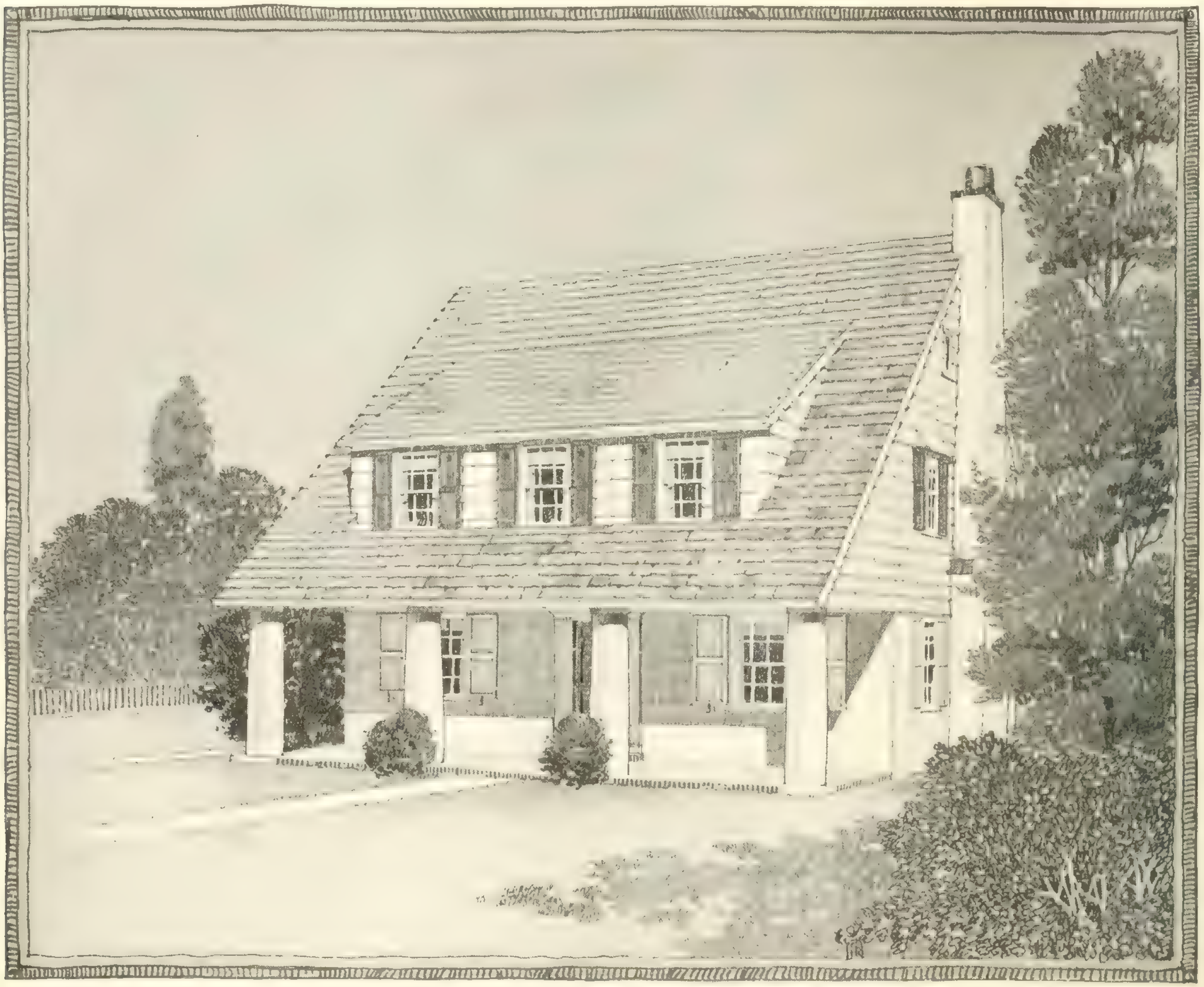
Designed by
GORDON ROBB
Architect for THE BUILDERS' JOURNAL



NOT all families are small, and the man with a large family is not very comfortable in the 5- or 6-room houses that are generally offered today. Frequently he has no larger purse than the small-family man, and he has a real problem to get a house with at least 4 bedrooms (for that is where the space is needed), at a price he can afford to pay.

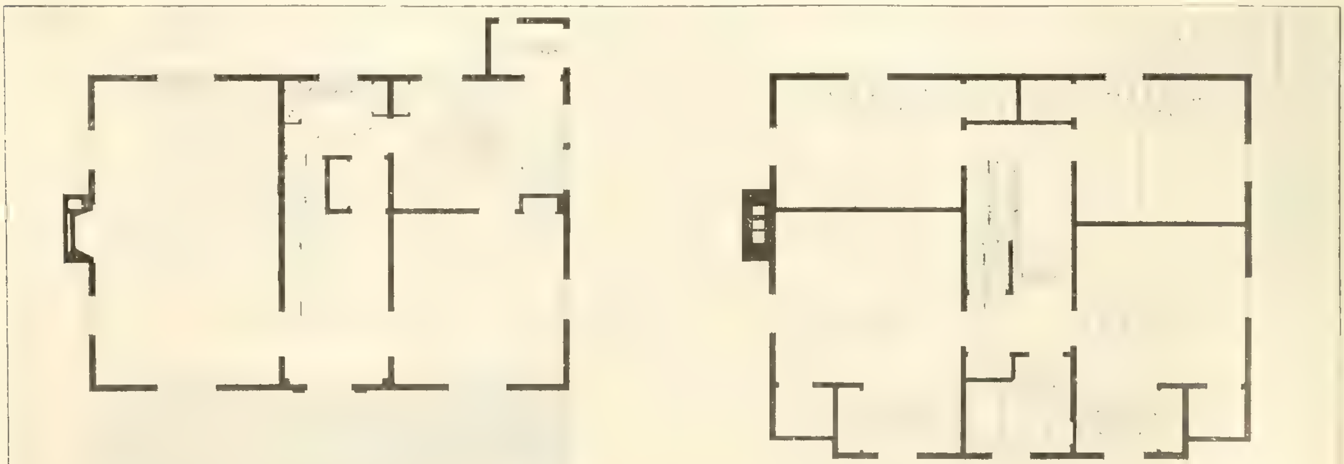
THE BUILDERS' JOURNAL house this month provides a solution. It is simple in framing and of only moderate size on the first floor, but by extending the second floor over the big veranda, 125 sq. ft. additional floor space is provided for bedrooms. There are 4 bedrooms on the second floor, each equipped with a large closet, and on the third floor is an additional bedroom. A linen closet opens into the second floor hall and leaves a recess in the bathroom for building in the modern type of square-end tub that rests on the floor without legs. Additional storage space may be had by building in 2 or 3 drawers in each of the front bedroom closets to take advantage of the low spaces under the sloping roof either side of the dormer.

The first floor shows an open and spacious arrangement, the living and dining rooms being reached from the hall through wide cased openings. A coat closet is at the rear of the hall, in the passage to the pantry. The kitchen is compact and conveniently planned; the connection with the dining room is direct, to save steps.



A POPULAR and inexpensive type of house suitable for suburb or country. The dormer gives excellent bedroom space and full height ceilings. Distinction given by stucco columns, large porch and outside chimney. Regulation ¼ in. scale plans may be had at moderate cost.

Any questions addressed to The Builders' Journal regarding the house will be answered by Mr. Robb.



# Quantity Survey

*By Frederick H. Hunter*

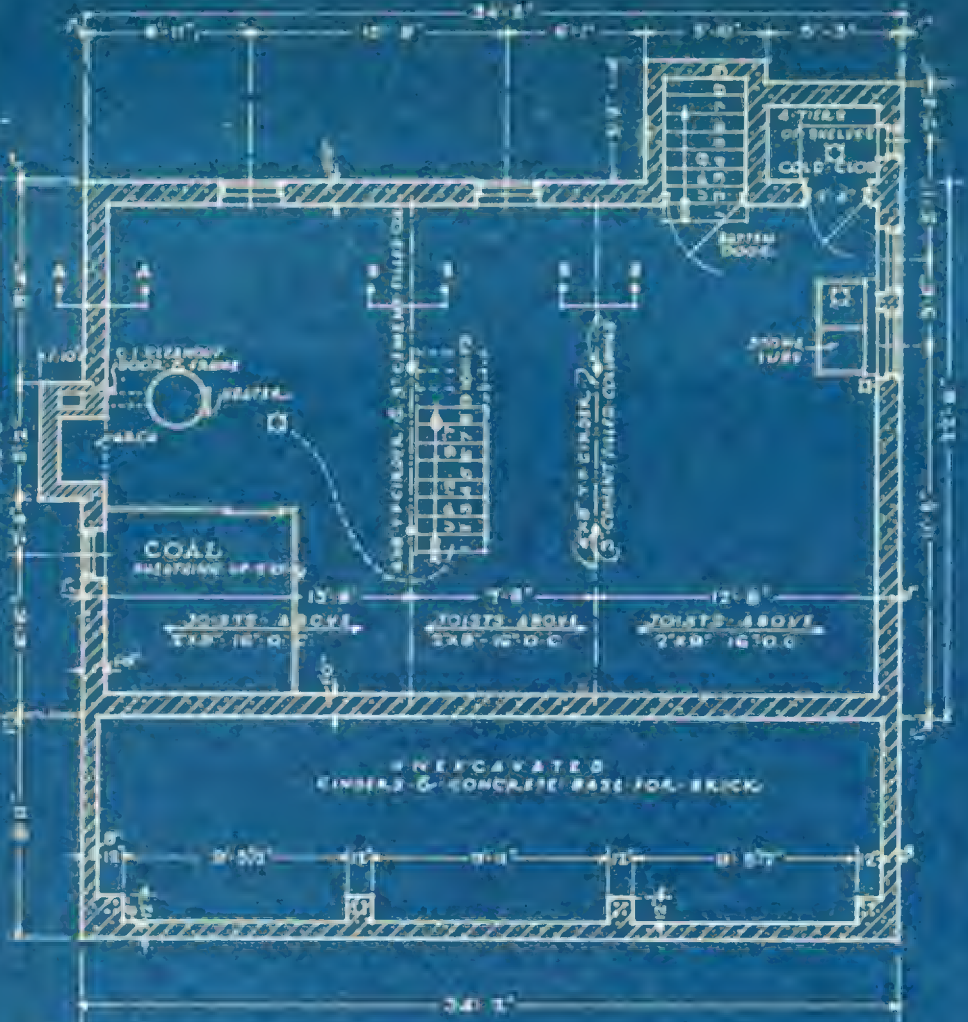
THE quantities listed here are for estimate purposes. All measurements are NET unless otherwise noted. Quantities such as sheathing, flooring, roofing, etc., are given by area with no allowance for wastage, matching of lumber, etc. Minor outs are disregarded. No attempt has been made to include all the small items nor such items as clearing the site, drains, supplies, etc., which must be governed by local conditions. Where the word "Item" appears in the quantity column it indicates that the expense of the work in question would probably be set as a lump sum based on data available at the time.

| | |
|---|---|
| Strip loam; about 10 ft. around site—assuming loam to average 8 ins. deep | 69 cu. yds. |
| Excavation for cellar | 215 cu. yds. |
| Excavation for trench walls, footings, etc. | 24 cu. yds. |
| Concrete foundations<br>(See p. 63) | 12 cu. yds. |
| Forms for foundations; (contact area) | 2400 sq. ft. |
| Cement wash, for basement window sills | 15 lin. ft. |
| Concrete basement floor | 77 sq. yds. |
| Common brick for chimney<br>(At 20 per ft. this is 4 M)<br>(*See p.* 53) | 202 cu. ft. |
| 8 x 12 flue lining | 38 lin. ft. |
| 12 x 12 flue lining | 26 lin. ft. |
| Thimble piece for 8 x 12, included in flue lining | 1 |
| Metal thimble for smoke pipe | 1 |
| Clean out door and frame in chimney | 1 |
| Terra cotta chimney pots | 2 |
| Cement chimney cap, 2′ 2″ x 3′ 4″ | Item |
| Cinder fill for porch; rammed | 18 cu. yds. |
| Concrete underbody, for porch floor | 28 sq. yds. |
| Brick laid flat; basket pattern, in sand; for porch floor | 1140 |
| Brick on edge, in cement mortar, for border of porch and step | 240 |
| Cement bases, 2′ 8″ square, for porch columns | 4 |
| Cement step and tile insert, at front door | Item |
| Firestopping; about 2 M brick | Item |
| 3″ round tile flue, for venting gas range | 26 lin. ft. |
| Finished fireplace; (rough fireplace and trimmer arch included in previous item for chimney) | |
| Damper for 40″ opening | 1 |
| Mantel bar; (unless patent damper, which forms lintel, is used) | 1 |
| Brick for facing, lining, underfire and hearth<br>(*See p.* 51) | 210 |
| 3″ cement filled iron columns, with caps and bases | 4 |
| Framing lumber; (for girt frame)<br>(*See back cover*) | |
| There are no long lengths needed; no joist over 14′ 0″. Lengths are scheduled "to the next whole foot." That is, a piece 14′ 4″ is counted 15′ 0″. Lengths allowed for splices in sills, girts, ridge, etc. | |
| 2 x 9 sill | 123 ft., b. m. |
| 2 x 9 joists | 2740 ft., b. m. |
| Cross bridging of 1 x 2 stock | 130 lin. ft. |
| 4 x 6 girt | 230 ft., b. m. |
| 6 x 10 y. p., for porch girder | 170 ft., b. m. |
| 4 x 6 y. p., for porch posts and girder over dormer | 122 ft., b. m. |
| 2 x 6 rafters, including ridge; longest pieces 17 ft. | 1550 ft., b. m. |
| TOTAL CARRIED FORWARD | |

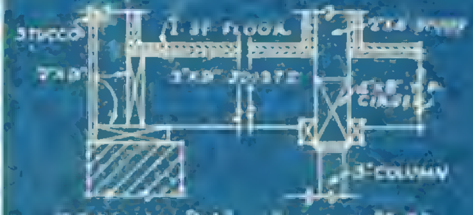
| | |
|---|---|
| TOTAL BROUGHT FORWARD | |
| 2 x 6 and miscl., for framing rear steps | 25 ft., b. m. |
| Wall framing; 2 x 4s, 12″ o. c. Include in price for plate of 2 x 4s doubled, usual bracing, etc. No outs taken for windows or doors on account of doubling and trussing | 2530 sq. ft. |
| Frame and block for deck in front of large dormer, including ties over porch girder | 24 lin. ft. |
| 2 x 4 ceiling framing in dormer and 3rd story, and collar ties in attic | 220 ft., b. m. |
| 2 x 4 stud partitions with 3 x 4 y. p. cap and one row of herring-bone bridging; lengths measured to girder or partition cap below, and no outs deducted | 864 sq. ft. |
| Non-bearing partitions of 2 x 4 and 2 x 3 studs; (include cap, sole and bridging) | 1320 sq. ft. |
| 2 x 10 for stair framing | 180 ft., b. m. |
| Roof sheathing | 1700 sq. ft. |
| Wall boarding | 1090 sq. ft. |
| Underfloors; square-edged boards | 1750 sq. ft. |
| Attic floor, of matched boards | 350 sq. ft. |
| Strap furr ceilings with 1 x 2, 16″ o. c. | 1785 sq. ft. |
| Furr down for sheathed ceiling of porch | 340 sq. ft. |
| Furr for metal lathing of stucco columns | 4 |
| Joist hangers; 4 x 9 over 4″ | 8 |
| Roof slate<br>(*See p.* 2) | 16 sqs. |
| Ridge; (metal or slate) | 34 lin. ft. |
| Metal roofing for rear dormer | 75 sq. ft. |
| Metal deck, 2 ft. wide at front dormer, turned down over the slate | 25 lin. ft. |
| Flashing under stucco | 30 lin. ft. |
| Flashing under wall shingles | 76 lin. ft. |
| Gutters; 4 1/2″ metal | 34 lin. ft. |
| Ends for gutters | 2 |
| 4″ metal gutters | 60 lin. ft. |
| Ends for gutters | 4 |
| 3″ metal leaders | 53 lin. ft. |
| 2 1/2″ metal leaders | 7 lin. ft. |
| Goosenecks and bands | 6 |
| Iron pipe for leader ends | 4 pcs. |
| Exterior windows; (include frame and sash; note backbands on casings) | |
| Cellar windows, 3-lt., 9 x 10 | 4 |
| Similar window, 2-lt., 9 x 10 | 1 |
| 16-lt., d. h., 9 x 12 | 3 |
| 12-lt., d. h., 10 x 12 | 3 |
| 12-lt., d. h., 10 x 11 | 11 |
| 12-lt., d. h., 9 x 10 | 1 |
| 9-lt., d. h., 9 x 11 | 2 |
| Mullion frame with 2 d. h. windows, 6-lt., 10 x 13 | 1 unit |
| 4-lt. casement, 9 x 10 | 1 |
| 2-panel shutters for first story windows; | |
| For 16-lt., 9 x 12 | 3 pr. |
| TOTAL CARRIED FORWARD | |

| | |
|---|---|
| TOTAL BROUGHT FORWARD | |
| For 12-lt., 10 x 12 | 3 pr. |
| Similar shutters with cut-out design for second floor; | |
| For 12-lt., 10 x 11 | 9 pr. |
| For 12-lt., 9 x 10 | 1 pr. |
| Exterior doors; (include frames) | |
| Front door, 3′ 2″ x 6′ 8″; Dutch door, 6 panels | 1 |
| Rear door, 2′ 8″ x 6′ 8″; glazed, 6-lt., 2 panels under | 1 |
| Exterior finish | |
| *(See p. 57)* | |
| Moulding and soffit for main cornice | 34 lin. ft. |
| Returns for moulding and soffit | 2 |
| Similar cornice for large dormer | 25 lin. ft. |
| Fascia and staff moulding, for porch cornice | 34 lin. ft. |
| Cornice for rear dormer | 13 lin. ft. |
| Cornice for rear porch | 9 lin. ft. |
| Staff mould, for shingled rakes | 114 lin. ft. |
| Rake mould, for rear dormer and porch | 22 lin. ft. |
| Hoods over windows | 5 |
| Bed mould, at top of stucco | 102 lin. ft. |
| Pilasters and crown mould, for front door | Item |
| Soffit for hood over rear door | 8 sq. ft. |
| Treads for rear steps | Item |
| Risers for rear steps | 8 lin. ft. |
| Ends for rear steps | Item |
| Louvre opening; screened; in rear entry | 1 unit |
| Aprons under exterior doors | 2 |
| Bulkhead doors and frame | 1 unit |
| Shingles; large wall shingles, laid 10″ to the weather; include sheathing paper | 11 sqs. |
| Interior doors | |
| 2′ 6″ x 6′ 8″ | 11 |
| 2′ 6″ x 6′ 0″ | 1 |
| 2′ 4″ x 6′ 8″ | 5 |
| 2′ 4″ x 6′ 0″ | 1 |
| Frames for single doors | 18 |
| Interior finish | |
| *(See inside of front cover)* | |
| 4 1/2″ moulded trim, with mitered joints | 1130 lin. ft. |
| Window stools and aprons | 74 lin. ft. |
| Stop beads for sides | 184 lin. ft. |
| Head stops | 68 lin. ft. |
| Jamb and head, for cased openings | 50 lin. ft. |
| Pilasters in living room | 4 |
| Beams in living room | 26 lin. ft. |
| Mantel in living room | 1 unit |
| Panel mouldings over mantel | 1 unit |
| Casing for corners in hall | 2 units |
| Wardrobe for coat closet; include flap doors and shelving | 1 unit |
| China closet | 1 unit |
| Linen closet; include flap doors and shelving | 1 unit |
| Medicine cabinet in bathroom | 1 unit |
| Wardrobes in bedrooms 3 and 4; include flap doors, shelving and drawers | 2 units |
| Shelves and hook strips for closets | 17 lin. ft. |
| Hanging rods | 17 lin. ft. |
| Case A in pantry | 1 unit |
| Case B in pantry | 1 unit |
| Pantry counter, with drawers under | 1 unit |
| Sink frame and counter in kitchen; cupboard under | 1 unit |
| Ironing board | 1 unit |
| TOTAL CARRIED FORWARD | |

| | |
|---|---|
| TOTAL BROUGHT FORWARD | |
| Case C in kitchen | 1 unit |
| Picture moulding | 450 lin. ft. |
| Chair rail in kitchen and bathroom | 48 lin. ft. |
| Stairs to 2nd and 3rd stories | |
| Treads 3 ft. long, with open ends | 8 |
| Treads with closed ends | 16 |
| Starting tread, curved end | 1 |
| Nosings at top | 2 |
| Plain risers | 26 |
| Starting riser; curved | 1 |
| Skirt board | 44 lin. ft. |
| String casing | 7 lin. ft. |
| Sawed ends and mouldings, under riser nosings | 8 |
| Stair rail | 7 lin. ft. |
| Easement at start | 1 |
| Newels | 2 |
| Handrail on brackets | 5 lin. ft. |
| Well rail | 9 lin. ft. |
| Sweeps at end | 2 |
| Well fascia and nosing | 17 lin. ft. |
| Sheathed rail, on 3rd floor | 8 lin. ft. |
| Cellar stairs | |
| Treads; 3′ 0″ long | 11 |
| Risers | 12 |
| Nosing at top | 1 |
| Plain handrail | 7 lin. ft. |
| Batten doors in basement; include frames | 2 |
| Studding for coal bin partition | 122 sq. ft. |
| Sheathing for coal bin partition | 80 sq. ft. |
| Building shovel hole and slide | 1 unit |
| Frame for 2 laundry trays | 1 unit |
| Plank steps in bulkhead | 1 unit |
| Plastering interior; (on wood or metal lath) | |
| *(See pps. 3, 59, 61)* | |
| Ceilings | 198 yds. |
| Stair soffits | 10 yds. |
| Basement ceiling; (if plastered) | 74 yds. |
| Walls | Net 580 yds. |
| (Or half outs, 644 yds.) | |
| Keene's cement dado in kitchen and bathroom | 20 yds. |
| Corner beads | 52 lin. ft. |
| Exterior stucco on metal lath and back plastered, or on patent wood lathing with waterproof backing | Net 99 yds. |
| *(See pps. 3, 59, 61)* | |
| (Half outs 105 yds.) | |
| Stucco for porch columns; 8′ 0″ high, 2′ 0″ diameter, with plain caps | 4 |
| Stucco on chimney | 26 yds. |
| Build in slate for wash on chimney | Item |
| Staging to reach chimney | Item |
| Allow for work not listed in the survey: | |
| General or overhead costs | Item |
| Grading, walks, planting, sodding, etc | Item |
| Connections for water, sewer, gas, etc | Item |
| Insert sub-bids for other trades: | |
| Hardware | Item |
| *(See pps. 4 and 59)* | |
| Allow for setting hardware | Item |
| Painting | |
| *(See p. 62)* | |
| Plumbing | |
| Heating | |
| *(See inside of back cover)* | |
| Electrical work | |
| Fixtures | |
| TOTAL AMOUNT | |

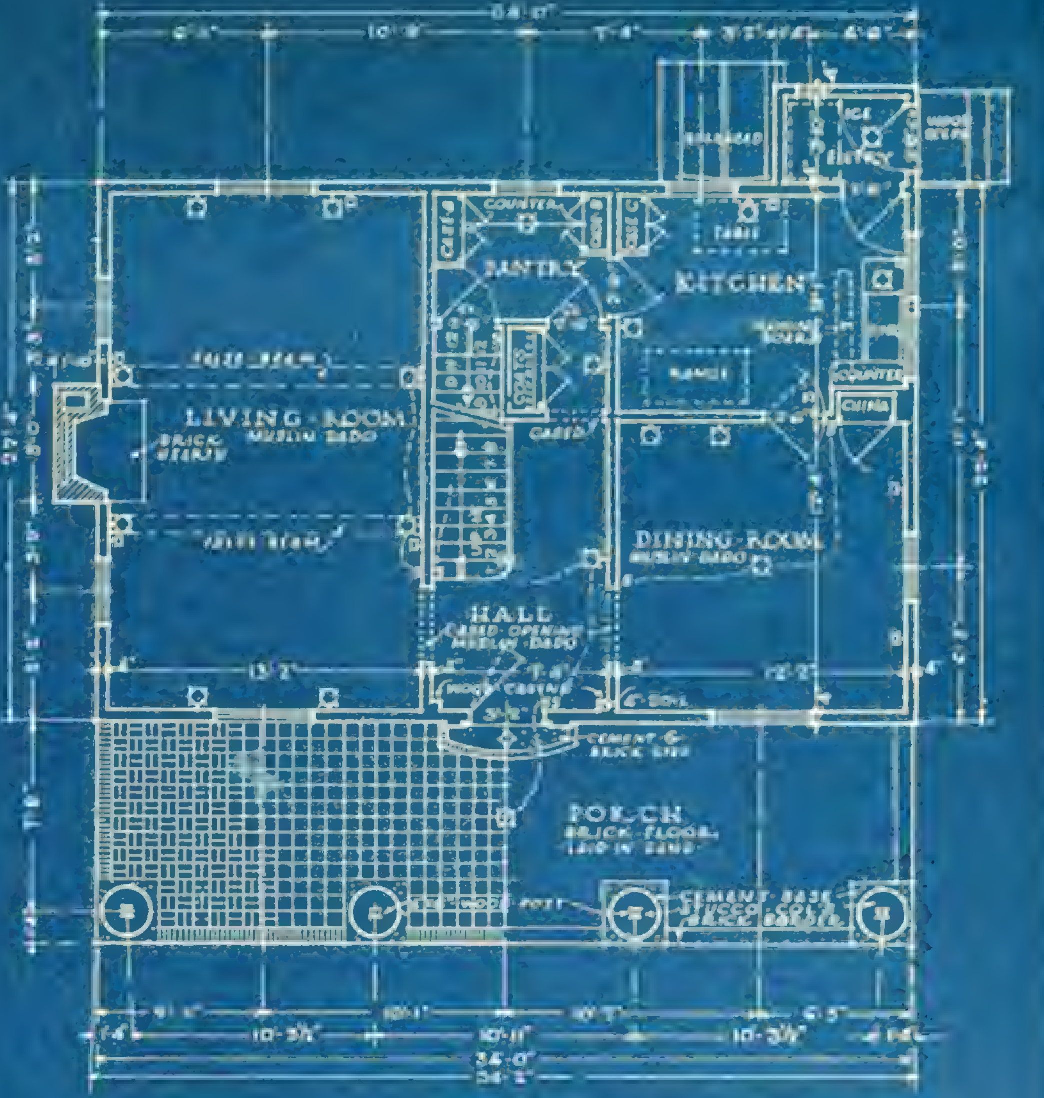


PLAN·OF
BASEMENT



SECTION·A·A· SECTION·B·B·
SCALE ½"=1'-0"

SCALE ⅛"=1'-0"



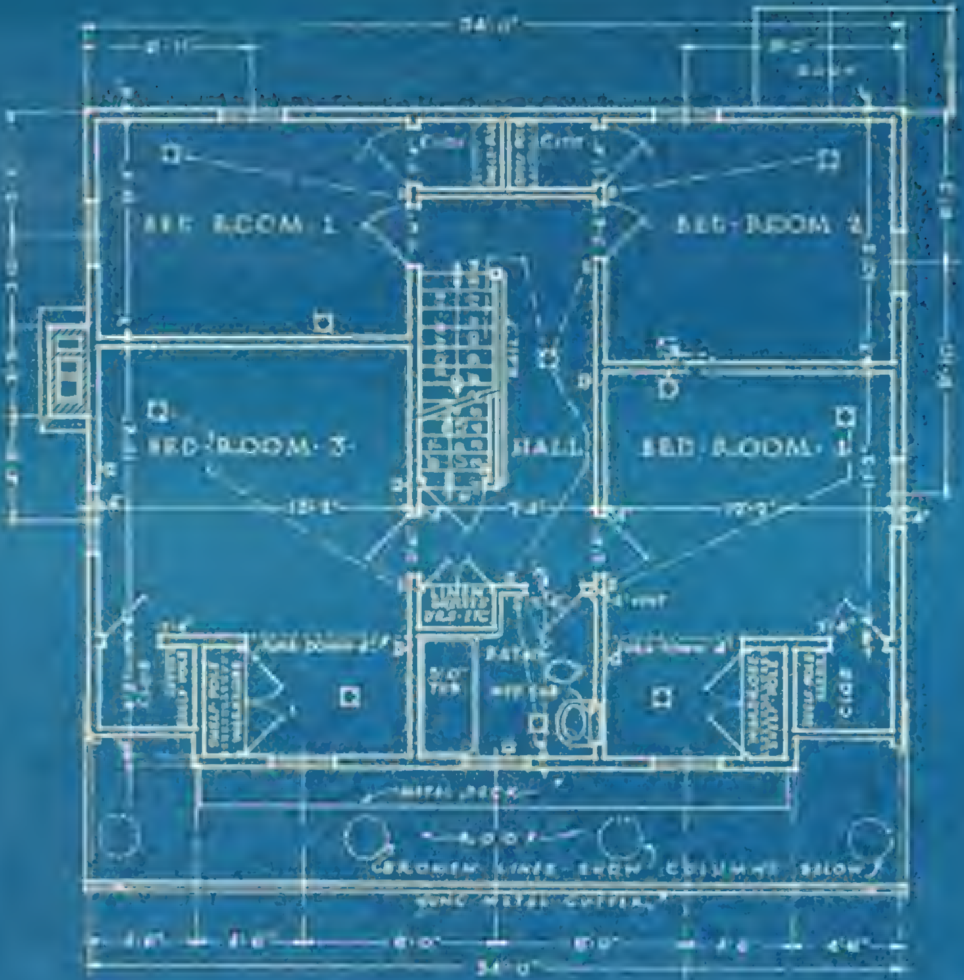
PLAN·OF·FIRST·FLOOR

DRAWING·NO· (61)

A·SEVEN·ROOM
HOUSE

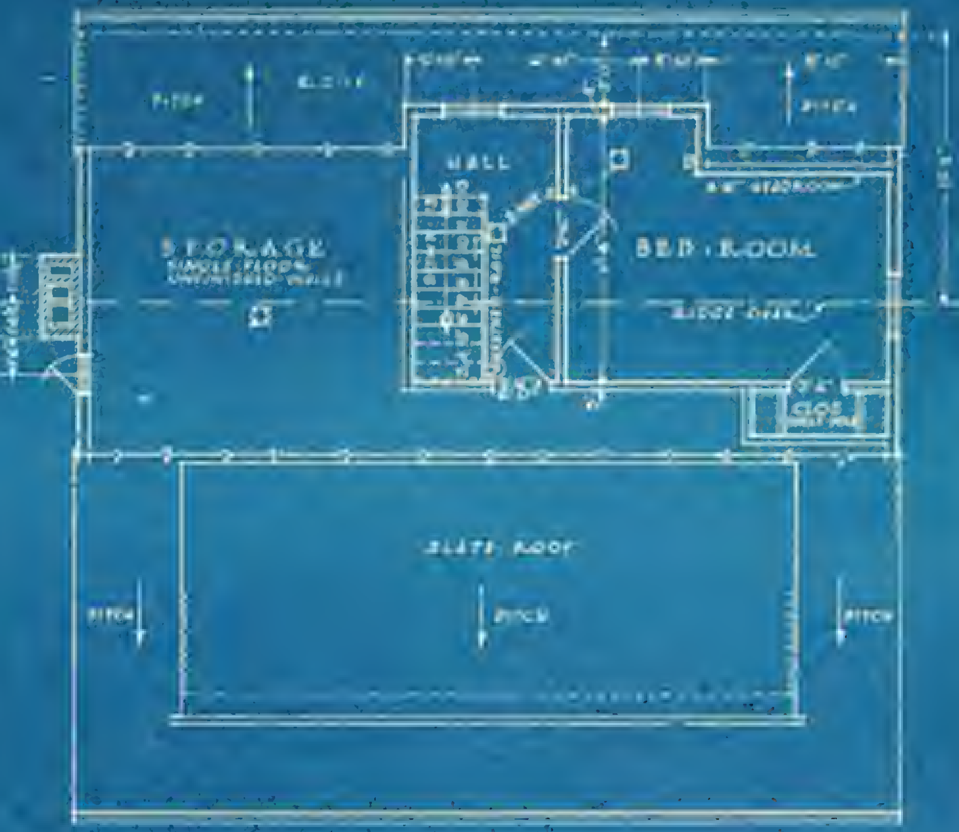
The BUILDERS' JOURNAL WORKING DRAWINGS

NO 14
JUNE·1921



PLAN · OF · SECOND · FLOOR. Scale 1/8"=1'-0"

UNDER-FLOOR LAID DIAGONALLY IN PORTIONS
OF ROOMS OVER PORCH
PROTECT PLUMBING PIPES WITH MINERAL
WOOL



·PLAN · OF · ATTIC·

DRAWING No ②

A SEVEN ROOM
HOUSE

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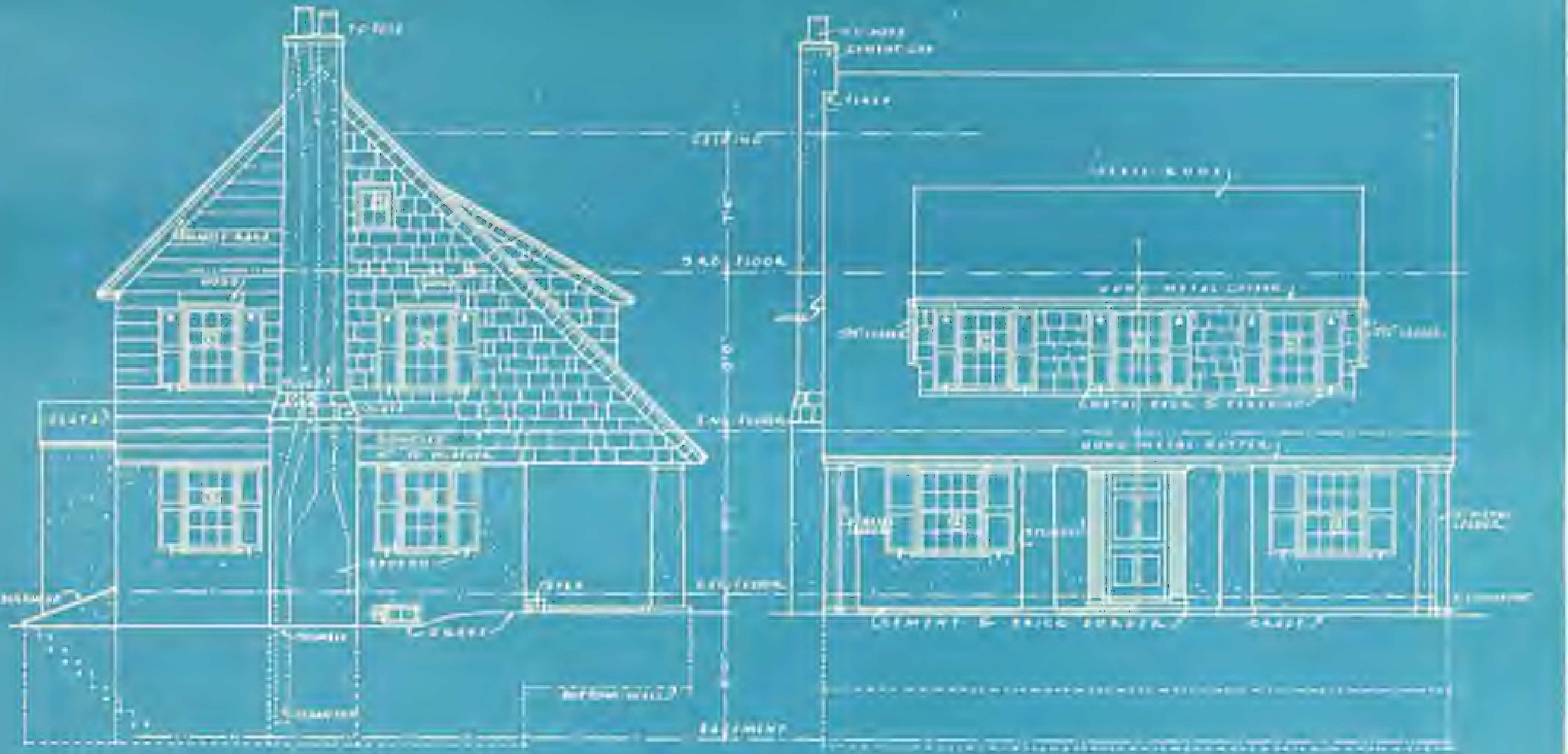
JUNE 1921



SIDE (LIVING RM) ELEVATION

SCALE 1/8"=1'-0"

FRONT ELEVATION

③

A SEVEN ROOM HOUSE

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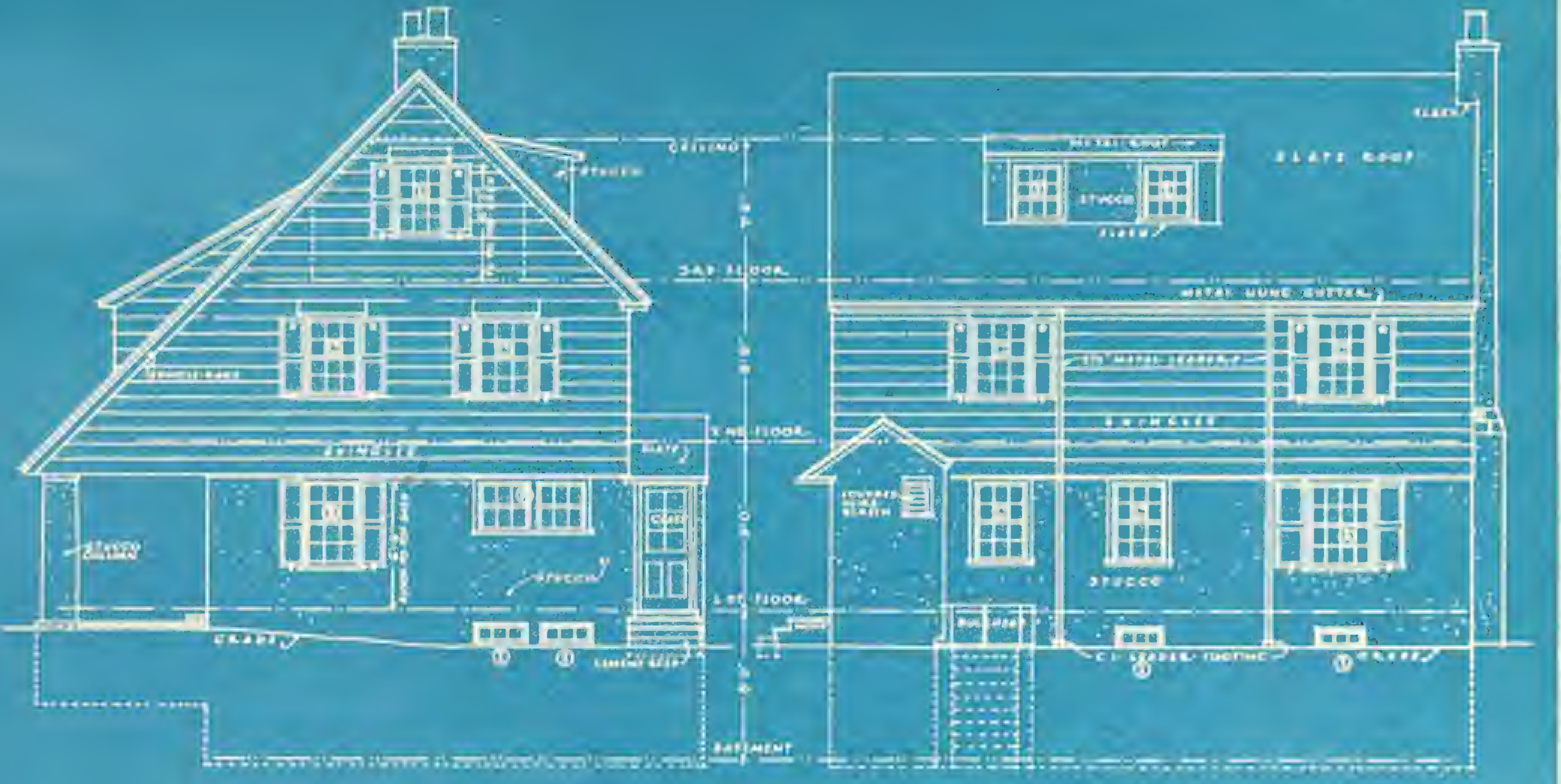

SIDE (DINING RM) ELEVATION · SCALE 1/8"=1'0"

·REAR ELEVATION·

A SEVEN ROOM HOUSE

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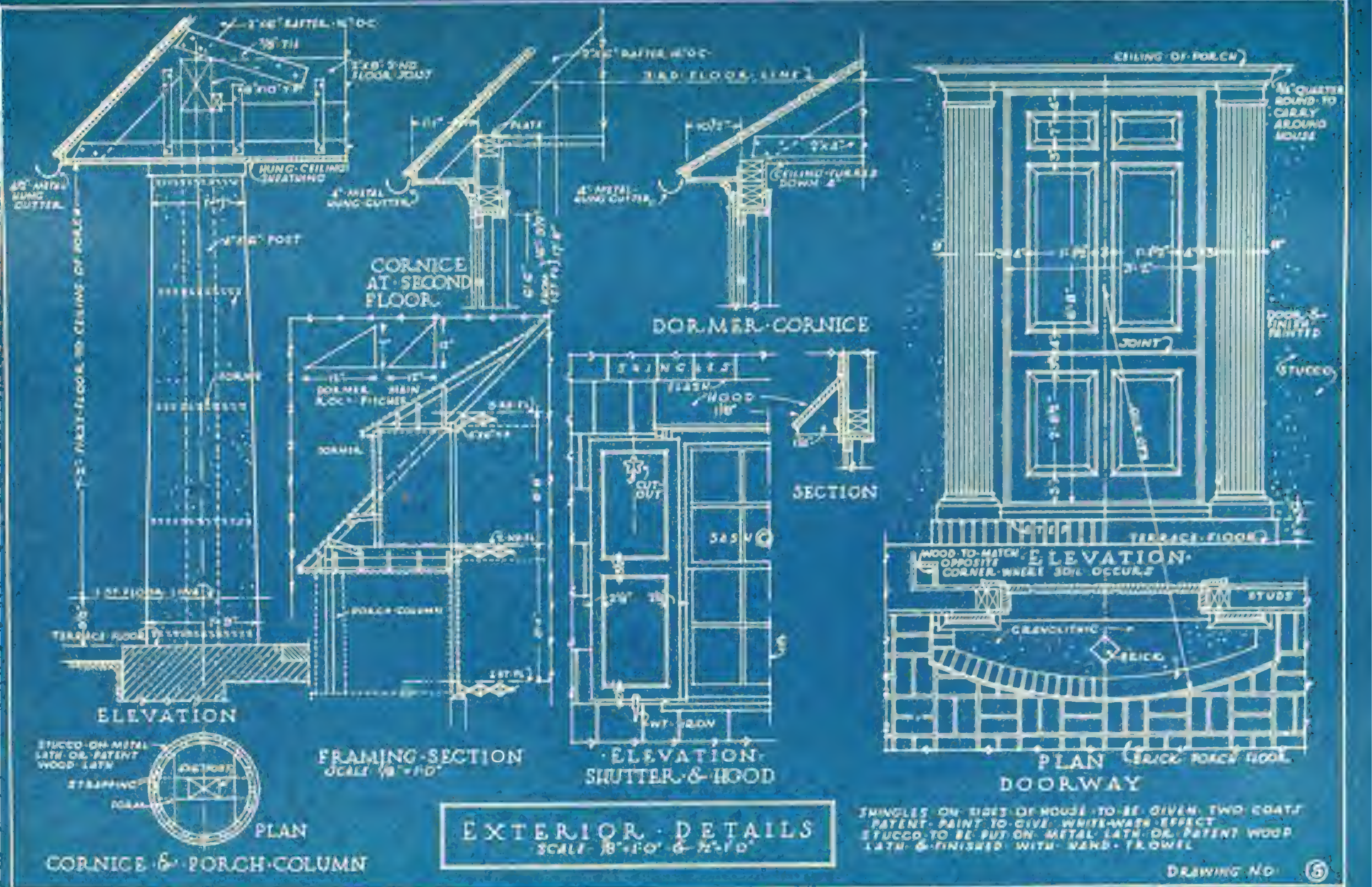


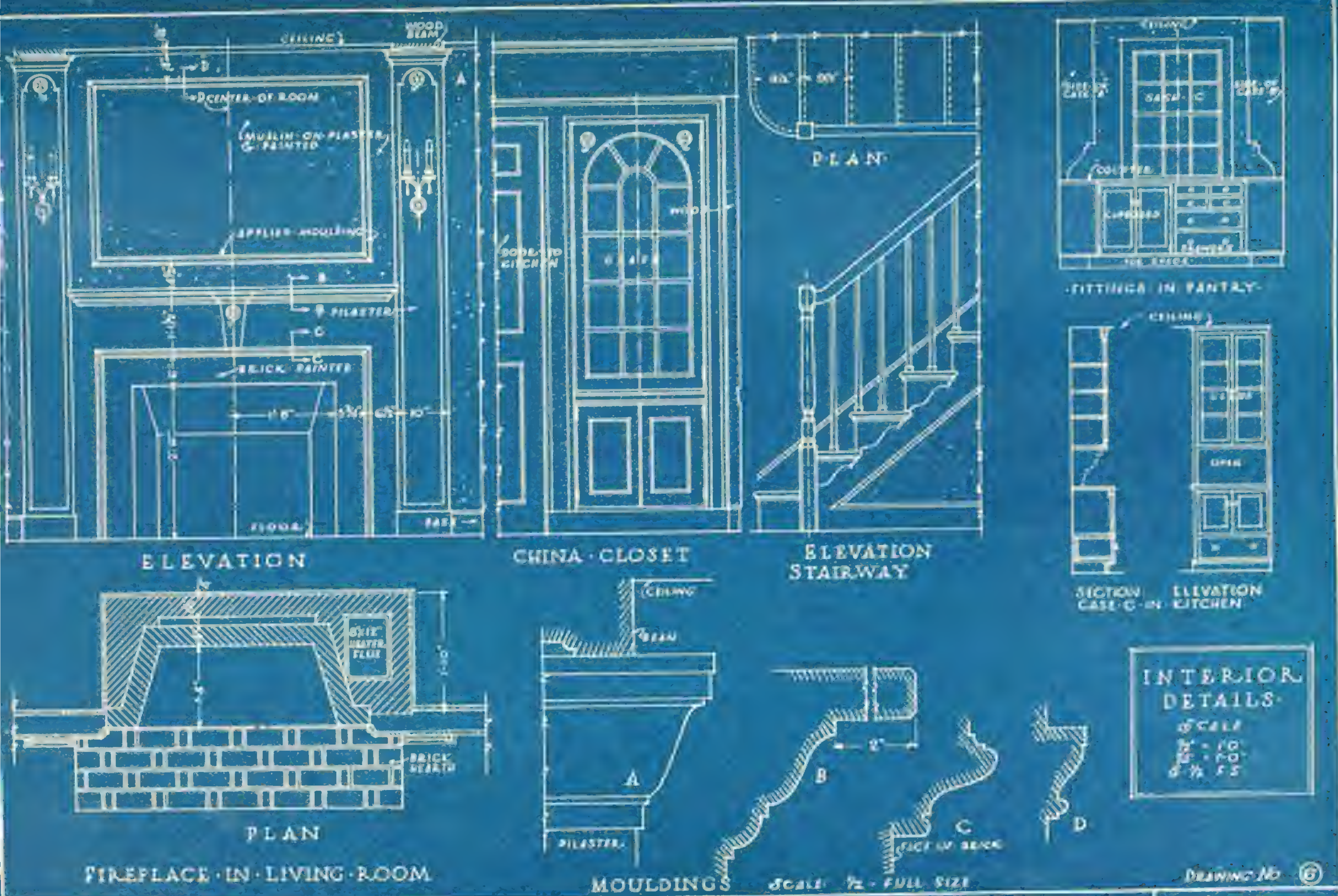
## EXTERIOR DETAILS

SCALE 1/8"=1'0" & ½"=1'0"

SHINGLES ON SIDES OF HOUSE TO BE GIVEN TWO COATS PATENT PAINT TO GIVE WHITE-WASH EFFECT
STUCCO TO BE PUT ON METAL LATH OR PATENT WOOD LATH & FINISHED WITH HAND TROWEL

DRAWING NO ⑥

| A·SEVEN·ROOM HOUSE | The BUILDERS' JOURNAL WORKING DRAWINGS | NO 14<br>JUNE·1921 |
|---|---|---|

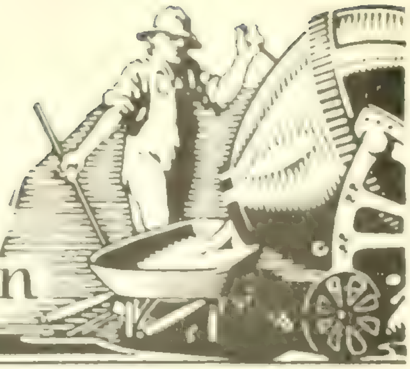


A SEVEN ROOM HOUSE

The BUILDERS' JOURNAL WORKING DRAWINGS

NO 14
JUNE 1921

# CONCRETE
## Form Work-Reinforcing Methods
## Monolithic and Block Construction



# Concrete Surface Finishes
## Part II. Application of Stucco to Concrete

*By A. J. R. Curtis*

PORTLAND cement stucco, properly handled with due respect to architectural requirements as to proportions of the panels, texture, color and contrasts, becomes an attractive and generally desirable surfacing for concrete, monolithic or block. It is equally true that concrete makes a most satisfactory base on which to apply stucco; for concrete walls are rigid, and the general efficiency of stucco, particularly its freedom from cracks, depends largely on rigidity of the base.

One man with a helper, working under average conditions, can usually apply the equivalent of 35 or 40 sq. yds. of stucco per day, figuring two-coat work on a reasonably favorable backing of concrete. Local costs vary so widely that it is difficult to give reliable cost figures at present, but the materials for a two-coat job on concrete should not run over 35 or 40 cents per square yard. Retail prices for the work run in the neighborhood of $1.25 per square yard.

Whereas in the application of stucco to wood or metal lath three coats are required, only two coats need be used when the backing is concrete. In ordinary stucco application on lath, the function of the first or scratch coat is to form a bond with the base and to provide satisfactory support for subsequent coats. The second coat, often known as the brown coat, is used to establish a true surface on which to apply the finish. While the first coat need have a thickness of 1/4 in. over the lath, the humps and hollows incident to lath construction usually require a somewhat thicker second coat, often 1/2 in. in thickness. The final coat is, of course, merely a decorative covering, and it need be no thicker than the selected style of surface treatment demands. This is usually from 1/8 in. to 1/4 in.

Fig. 3. "Rough cast" or "spatter dash"

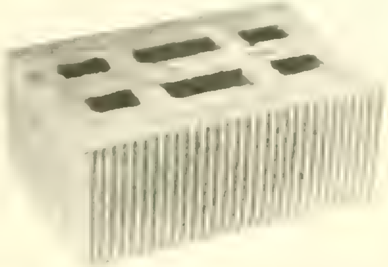
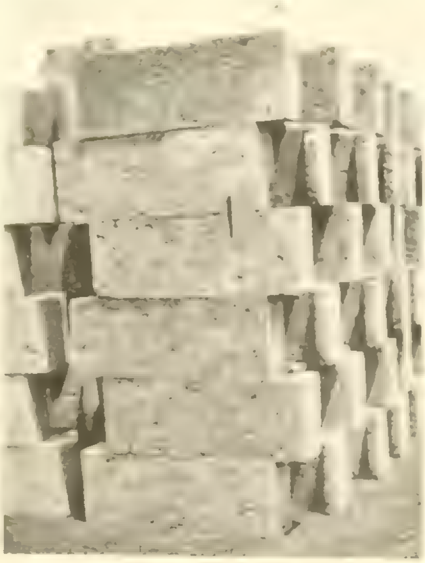


Fig. 1. Concrete tile, with corrugated surfaces to receive stucco

Fig. 2. Concrete block of gravel aggregate, showing surface for stucco



In the application of stucco to concrete and masonry surfaces, the use of the first coat just described is not necessary, because its functions are fully taken care of by the backing itself. In the case of concrete backing, particularly well laid concrete block, the brown coat may be very thin, since the wall itself will usually be quite true. Thus, in stuccoing on concrete, one coat is entirely done away with and another reduced considerably from the thickness usual on lath. In addition to these savings of material, there is an additional saving from the fact that the wastage in application is less on concrete and other good masonry bases.

Monolithic concrete surfaces must be of rough and coarse texture in order to form mechanical bond with the stucco. Smooth, dense textures should be avoided and, where impossible to avoid, roughened. Perhaps the most economical method of roughening under ordinary conditions is by means of a wire brush used immediately on removal of the forms and while the concrete is still green and relatively soft. If roughening is postponed until the surface will not yield to the scratching tool or wire brush, the more expensive and difficult method of hacking or chipping must be resorted to, using ordinary stonecutter's tools.

Concrete structural tile and block are provided with proper texture to

Fig. 4. "Sand sprayed" stucco finish

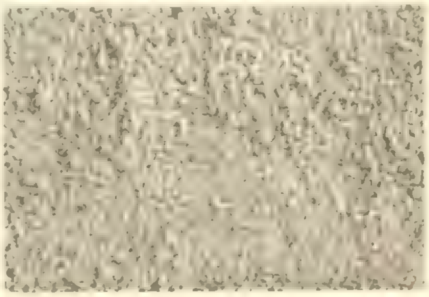
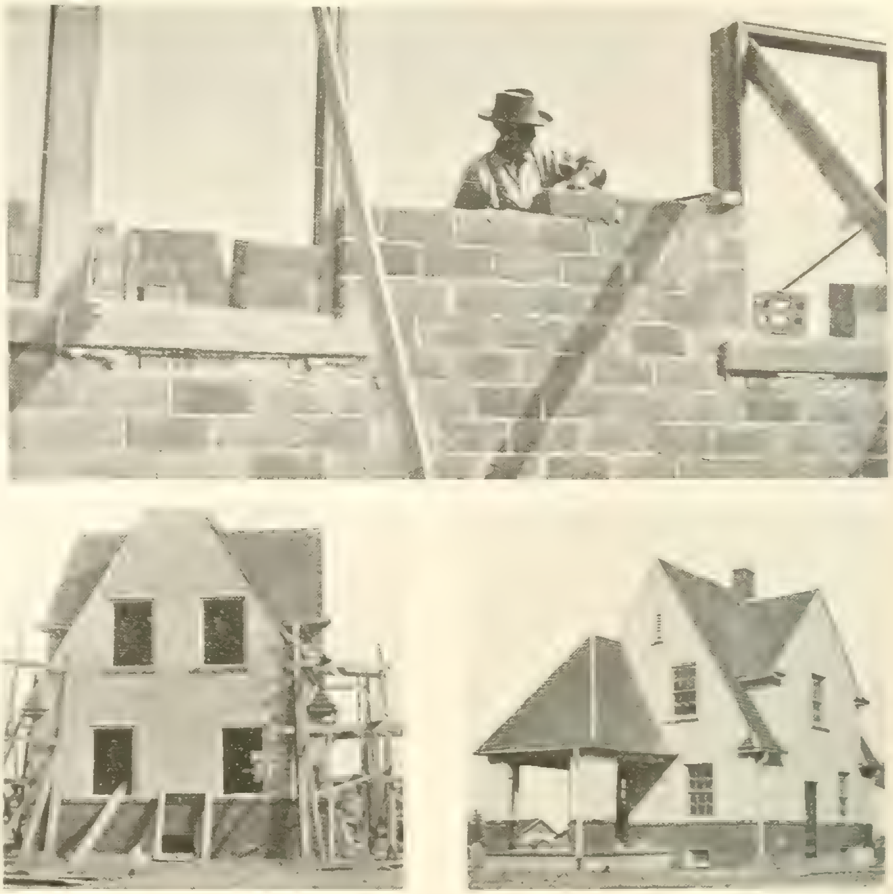


Fig. 5. Application of stucco to houses of concrete tile. Views show **detail of wall and house before and after stucco finish coat**



take stucco without any further treatment whatever. All concrete tile to be stuccoed have fluted or corrugated surfaces, as shown in Fig. 1. Block are also commonly provided with similar surfaces in certain localities. However, the greater number of manufacturers sell block surfaced as shown in Fig. 2, where the block are made with a gravel aggregate; in other cases the block are made with a limestone aggregate. All of these surfaces have proved very satisfactory. The tile, having thin walls, naturally require a mixture confined to relatively fine particles which give smooth surface, and so the corrugations are required. Block made of material containing a large proportion of particles up to 1/2 in. in size usually have a sufficiently rough texture as made, where no surface mortar is used.

It is important that concrete structural tile and block be laid in cement mortar containing only enough lime to make it easily workable. The presence of lime in any considerable quantity in the joints may cause discoloration on the surface, defining the joints through the stucco. This might be caused either by a difference of absorption between the concrete block and lime mortar, or by efflorescence in the vicinity of the joints induced by the presence of lime. Either flush or raked joints may be used in laying up units to be stuccoed over.

Before stucco is applied, concrete walls should be brushed free of dust, dirt and loose particles and moistened to such a degree that water will not be rapidly absorbed from the plaster. However, the wall should not be drenched to such an extent that water will remain standing on the surface when the stucco is applied.

In two-coat stucco work on concrete surfaces, the first coat should contain not less than 3 parts of sand or other fine aggregate to 1 part Portland cement. Perhaps the most satisfactory results have been with mixtures varying from 1:3 to 1:4 of cement and sand. Recent investigations seem to indicate that such mixtures of well graded aggregates are

Fig. 6. A good example of careful **"spatter dash" stucco work. Note** lively texture of walls

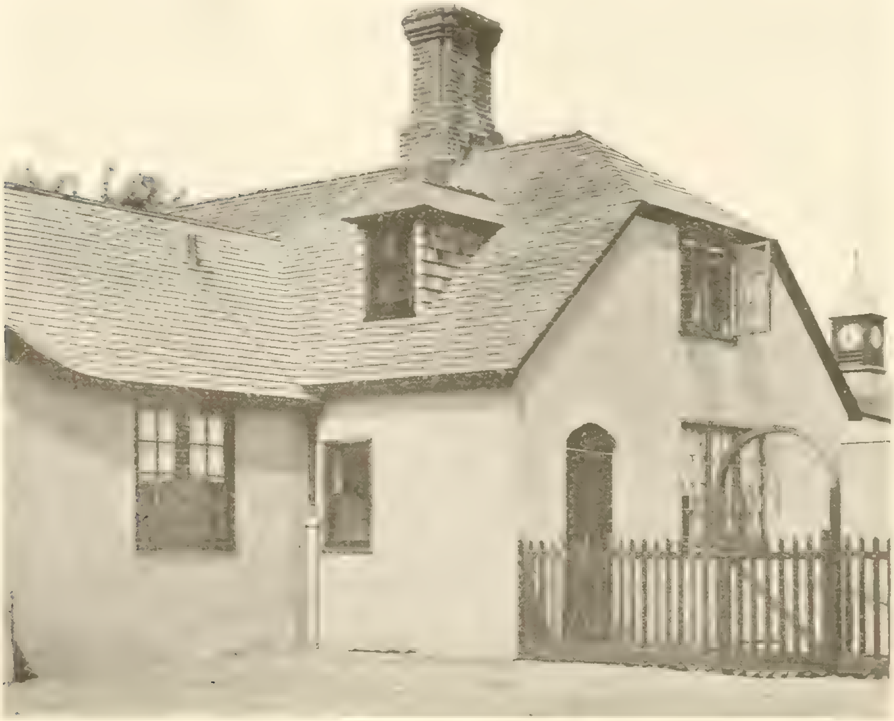
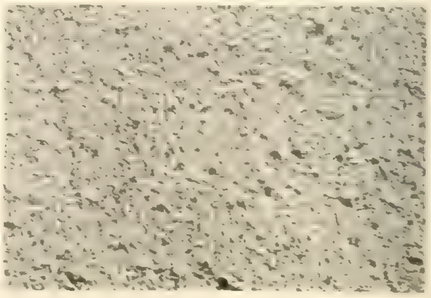


Fig. 7. Tooled "exposed aggregate" surface



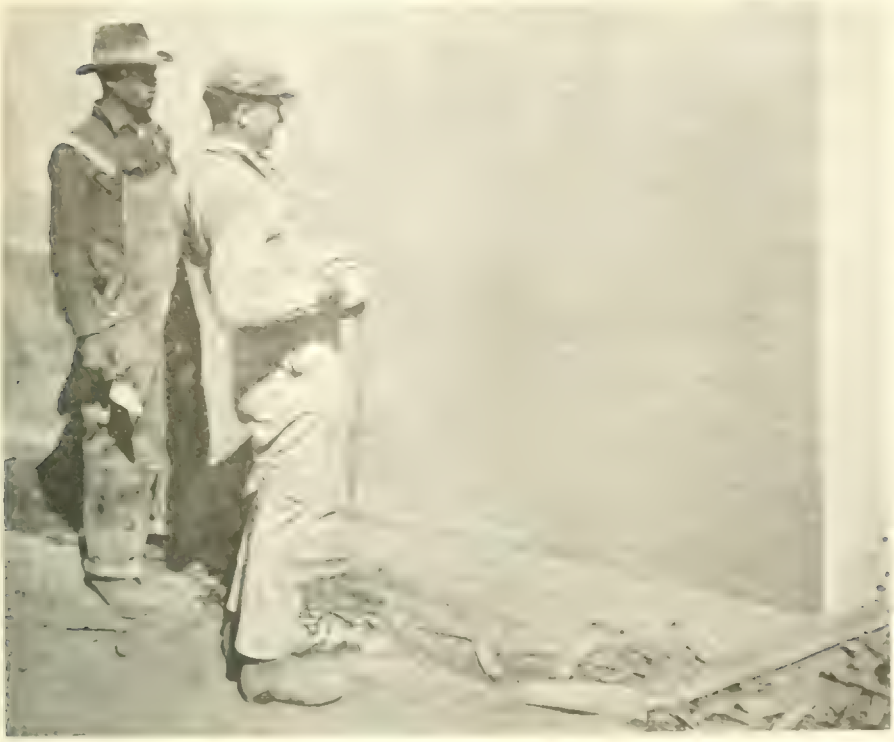


Fig. 8. Stucco being projected on a concrete wall with electric stucco machine. Rotary paddle is motor driven; stucco placed in hopper by helper

more satisfactory than richer mixtures, possibly due to greater volume changes of rich mixtures and consequent greater possibility of cracking. The stucco mixture should be thoroughly mixed, preferably in a drum type mixer, for at least five minutes. The first coat is given a rough float finish, to provide bond for the final coat, and must be true to plane, as the surface coat cannot be used to correct deficiencies in this regard.

The finish coat is applied as long as practicable after the first coat. An interval of at least one week should elapse, in order to permit volume changes (shrinkage) in the under coat, and permit it to attain a considerable degree of strength. The surface to which the finish coat is applied must be damp, but in no case thoroughly saturated. Various kinds of surface coats are necessarily mixed in different consistencies, from relatively dry to quite wet, and whereas the surface to which application is made should be quite wet in case of the dry consistency, it would necessarily have to be quite dry in the case of the wet consistency. The surface of the first coat should be in such condition that it will absorb all excess water from wet mixtures, but not remove any necessary water from dry mixtures. The proportions of finish coat mixtures [illegible] considerably with the materials to be used, methods of application and [illegible] [illegible]

## Common Finishes

[illegible] widely used finish, and is shown in [illegible] and cures to a uniform color and [illegible] 20 ft. or more), provided all factors, such as proportions, consistency, materials, and method of application, are unchanged throughout progress of the work, and provided the work of application is carried on uninterruptedly. Work must never be stopped except at the completion of a panel or other definite division of the work. An objection sometimes raised to this type of surface is that the roughness of texture accumulates dust and, therefore, is likely to streak below window sills and wherever water may be washed upon it occasionally, but it continues to be a popular finish, nevertheless.

The finish is applied by bringing the finishing coat to a smooth, even surface with a finishing float; then, before it has had time to harden, coating it with a 1:3 to 1:4 mixture of cement and rough-fractured fine aggregate. The coating may be pro-

Fig. 9. "Applied aggregate" in colors

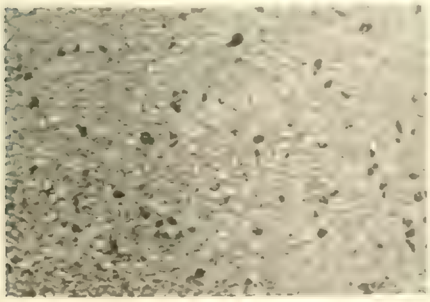
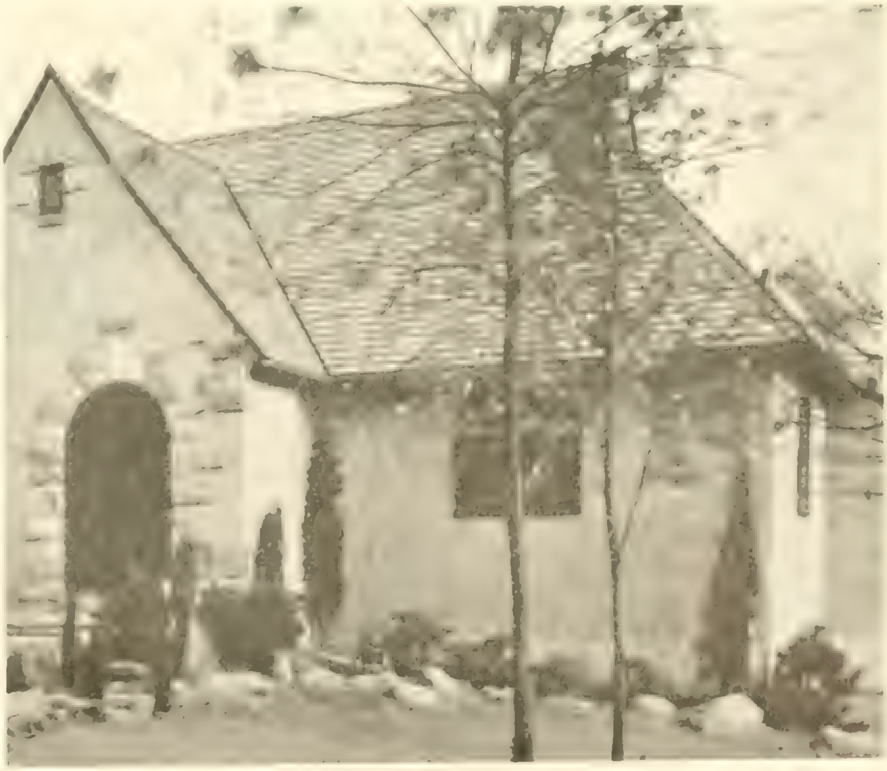


Fig. 10. A stucco finish in favor with English designs. Roughly troweled on, with trowel marks showing



jected by hand, with a broom, paddle or bundle of twigs, or mechanically by means of a power-driven rotary paddle projector as shown in use in Fig. 8.

*Sand sprayed.*—This finish, shown in Fig. 4, is similar but very much smoother and flatter in texture than that just described. A 1:3 creamy mixture of cement and sand is sprayed on the finishing coat while green, using a whisk or other fine broom or a suitable mechanical projecting machine. A still smoother finish can be had by using a float. This is commonly called a sand float finish. (Fig. 12.)

*Stippled.*—The finishing coat is troweled smooth with a metal trowel used as sparingly as possible, and then lightly patted with a brush or broom straw to give an open stippled surface.

*Applied aggregate.* — By this method clean round pebbles, or other selected material, carefully graded and ranging between 1/4 in. and 3/4 in. in size and previously moistened, are thrown forcibly against the wall or pressed against it so that they are firmly imbedded in the finish coat. The particles may be distributed evenly and pressed firmly into the mortar by the use of a clean wooden trowel, but the surface should not be rubbed after application of the surface particles. When quite hard, the surface may be scrubbed down with diluted hydrochloric acid and thoroughly rinsed with clean water.

This finish, by reason of its entire freedom from the unbroken, and sometimes characterless, cement color, bids fair to become very popular. The color effects and texture depend entirely upon the selection and graduation of the aggregates and, therefore, offer a wide range and variety. Fig. 9 shows a section of concrete wall surfaced by this method.

*Exposed aggregate.*—The surface coat of stucco is floated to a true plane, and within 24 hours is scrubbed with a stiff brush and water; if the stucco is too hard, a solution of hydrochloric acid and water varying from 1:4 to 1:10 will have to be used. The surface coat is of a selected mixture of fine aggregates, which are exposed by the brushing treatment, and is shown in Fig. 7. In case acid is used, the surface must be thoroughly rinsed to remove the acid, as soon as it has eaten to the desired depth.

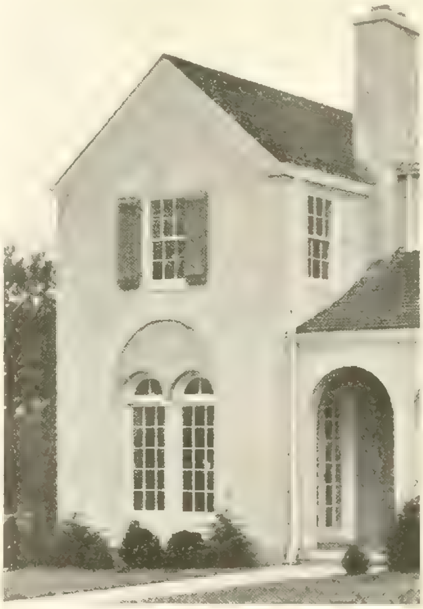


**Fig. 11. Extremely rough finish of "spatter dash" type. Stucco thrown from trowel in small lots**

Portland cement is available in two colors—the common gray and the white. Either may be used independently, or gray and white may be blended as required to give desired shades. White cement being considerably more expensive, it is economy to use the gray in preference, wherever it gives entire satisfaction. Different brands of gray Portland cement vary in shade to such an extent that they usually cannot be substituted one for another in the same work without danger of perceptibly affecting the color of the finished stucco.

This list gives the most commonly used aggregates for stucco surfacing mixtures. Most of these are supplied in assorted sizes from No. 20 mesh to 1/4-in.

Pink, red, yellow, gray, dark green and black granite.

Pink, red, yellow, green, black, white and mixed marble.

Spar in various neutral tints.

Mica spar in black and sparkling, transparent colors.

Yellow, buff, red and brown sandstone.

Yellow, white, red, brown and black gravel.

## Mineral Colorings

Very few, even of the best mineral colorings, may be relied upon to be entirely non-fading, where continuously exposed to the weather. Therefore their use is limited to a range of shades suggested by another tabulation. The quantities given will merely serve as a guide in working out required tones:

| *Color* | *Quantity of mineral coloring required per bag of cement* |
|---|---|
| Pink | 1 lb. red oxide of iron |
| Terra cotta | 2 lbs. " " " " |
| Light brick red | 4 lbs. " " " " |
| Red | 6 lbs. " " " " |
| Gray | ½ lb. carbon black |
| Light buff to yellow | 4 to 10 lbs. iron hydroxide |
| Brown | 4 to 10 lbs. brown oxide of iron |
| Blue slate | ½ to 4 lbs. lamp black or manganese dioxide |

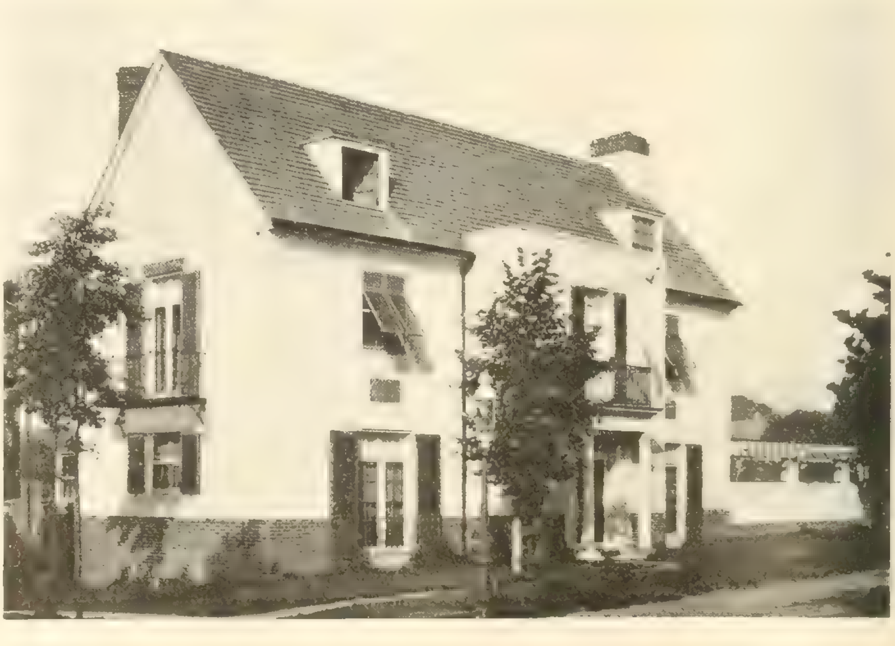


**Fig. 12. A "sand float" finish that prevents hair cracks, yet gives a smooth, formal effect**

# MASONRY
## Practical Information on Materials and Latest Construction Methods

# Hollow Tile Farm Buildings. I—The Silo

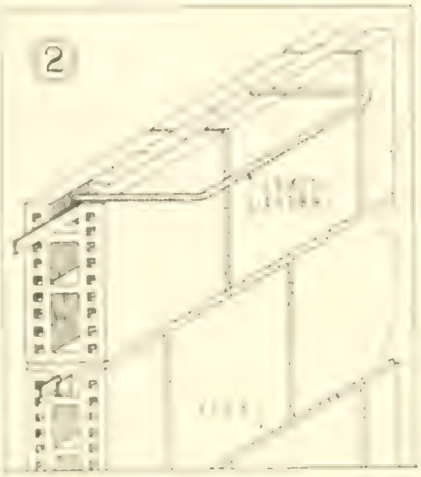
*By J. J. Cosgrove*

ONE HALF the people of the United States [illegible] in small rural communities. That means that over 50,000,000 people, with a potential purchasing power as great as that of city dwellers, are left to work out their own salvation with but little help from city merchants or building contractors, if we except, of course, the ever-present mail order houses. Contractors, masons, carpenters, plumbers,—in short members of all branches of the building trades, have a lucrative field right at their doors, and working this profitable field benefits the whole world, by making more attractive the move back to the farm.

In the early period of the development of the country, when pioneer and homesteader wrested the land from the wilderness, a farm consisted principally of the land and a barn. The house received little consideration, for that was for the comfort and convenience of the family; but the family could, did and had to put up with very few conveniences. Everything was sacrificed to the safety of crops and the welfare of stock.

The present tendency in fertile agricultural districts is to make an industrial group of the farm buildings, and to this end not only are buildings erected for purposes never considered seriously before, but these buildings are made of a more permanent nature, built to last for centuries and to be handed down from father to son. They are designed for the purposes for which they will be used, and are as highly specialized as buildings in any other industrial field.

If there is any one place where fireproof construction is advisable more than in another, that one place is on the farm. Should a group of farm buildings be destroyed by fire, particularly in the winter, that farm's business has been pretty well wiped out until the group can be rebuilt.



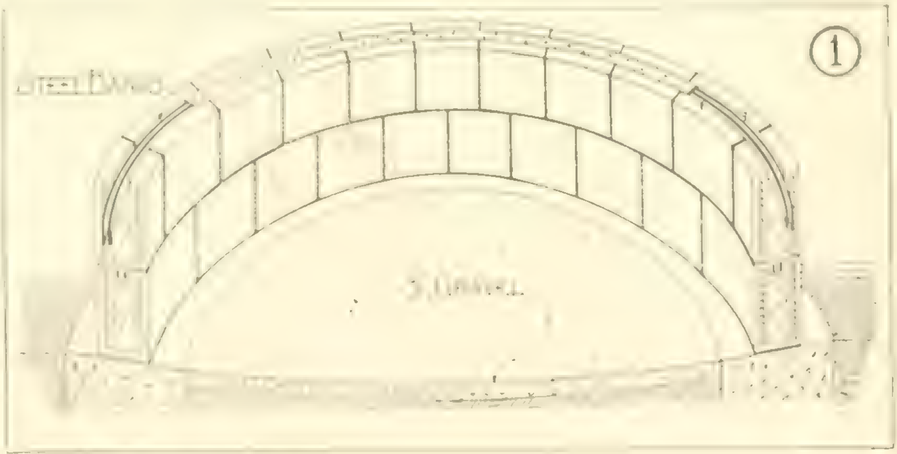
**Method of building iron ladder inside. Note that the ends are hooked over reinforcing band**

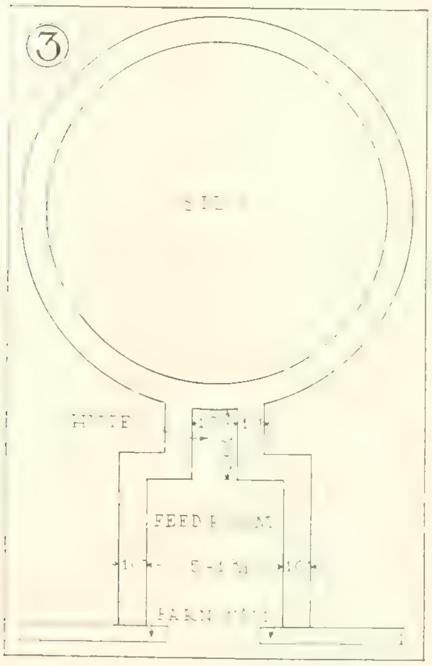
Hollow tile—tile in some form—is now extensively used on the farm. It is adapted for all purposes, from field drain tile to the walls of the home, the barn, the chicken house, corn crib, milk house and hog house. The building of the farmhouse can be passed over in this article, for a country home differs in no essential way from a like building on a city plot. It is only those special forms of construction, which the average builder would not be familiar with, that will be described here.

Part of every industrial group on a farm where stock is raised is a silo. This is in one sense a part of the barn, yet at the same time it is a separate and distinct structure, having its own individual function to perform. A silo makes a sort of sour corn, similar to sauerkraut, out of fodder corn. This sour corn, or ensilage, is not only a very nutritious food of which all stock animals are extremely fond, but it supplies vitamines to the stock in the winter months when live green food is scarce. It is not too much to say that no stock farm is complete without one or more silos, sufficient in capacity to take care of the needs of the stock.

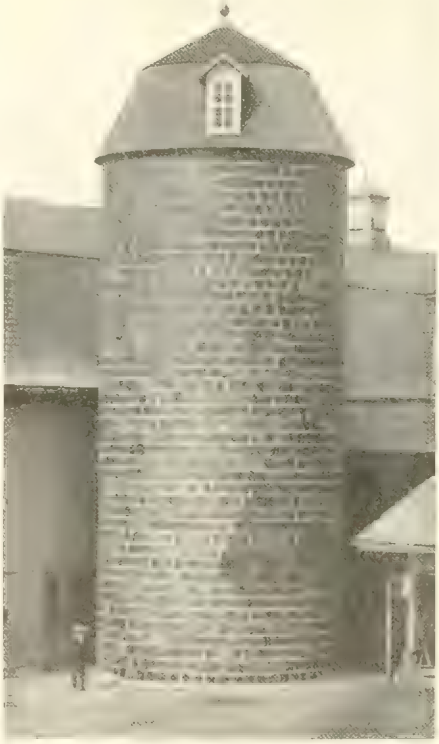
The method of making a silo of

**Detail of lower courses of tile silo, showing steel band in each course, imbedded in cement**

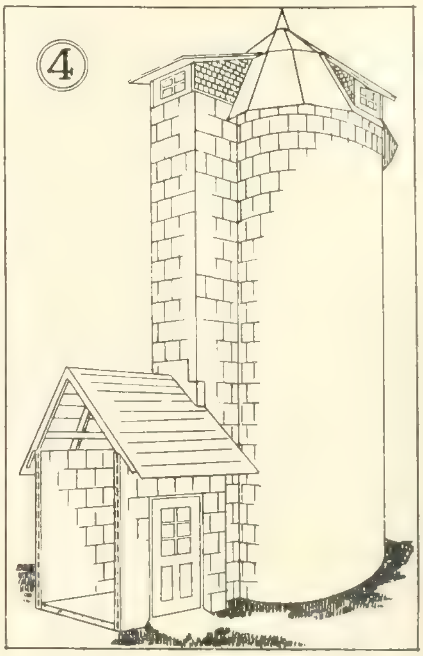




Plan of silo showing chute and feed room at bottom, connecting with the barn



View of glazed tile silo built according to directions in this article. Example of good masonry



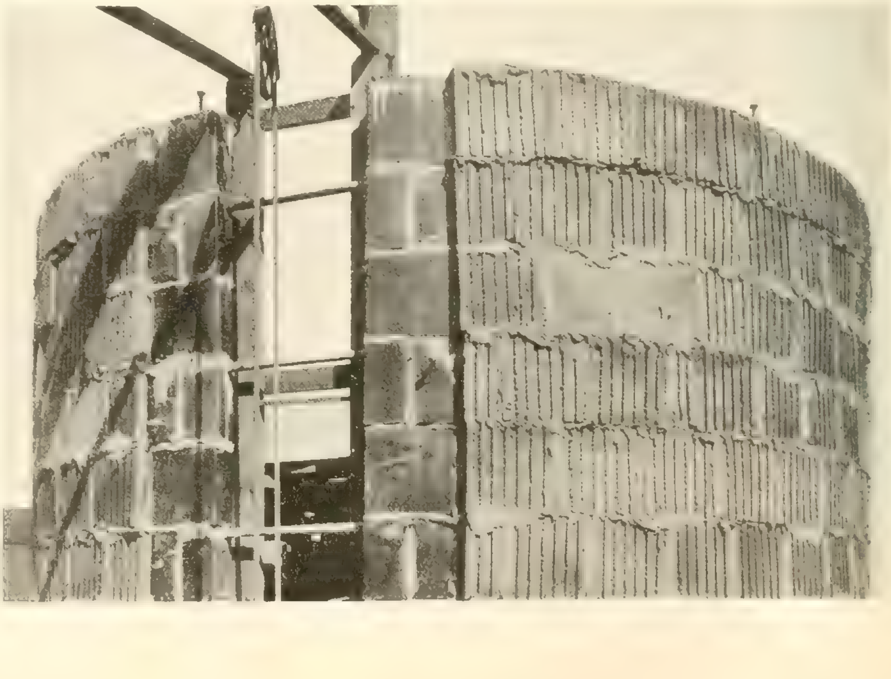
Sketch of silo shown in plan in Fig. 3. Note that chute and feed room are built of tile

hollow tile is shown in Fig. 1. The walls of the silo are built up of glazed tile, and each course of the tile is reinforced with steel bands bedded in grooves specially prepared for the purpose. This steel reinforcement is necessary to resist the bursting stress on the walls when the silo is full, and in order that the steel bands may not rust out or allow room for the courses of hollow tile to move or shift, the grooves must be slushed full of good cement mortar.

Whatever the diameter of the silo, it should be not less than 30 ft. in height. The higher a silo is, the closer the ensilage packs and the better it keeps. Thus as the height of the silo increases the capacity increases, not only by reason of the additional space, but also on account of the closer packing. For that reason it is evident that within the limits of the cutter to elevate ensilage, every foot added to the height of a silo makes it a better building from an operating standpoint.

In helping the farmer to determine the proper size of the silo needed, the diameter is the first dimension to be settled upon, notwithstanding the advantage of height, because a silo too large in diameter might cause a considerable loss of feed. Ensilage exposed for several days to the air dries out; that is, it loses the moisture which is necessary to preserve it, and which gives the odor and flavor so much liked by the stock. In summer, therefore, while the air is dry and hot, ensilage must be fed off faster than in winter, when the air is cold and moist.

From this it will be seen that a silo adapted for supplying a given number of stock in summer would be a safe size for the entire year. The number of square feet of ensilage exposed to the air on the feeding surface is in proportion to the diameter of the silo, and the number of cattle required to keep the ensilage fresh is in proportion to the number of square feet of ensilage exposed. Experience has shown that in order to feed off the proper amount of ensilage every day, the number of cows should be about 1 to every 9 sq. ft. of exposed surface



View showing silo for stucco coating. Scored tile furring blocks used outside. Reinforcing rods, in this case, serve also as a ladder on the top of the ensilage. Using this figure as a basis, the diameter of the silo to select can be determined from:

Table I

| Diameter of [illegible] | [illegible] | [illegible] |
|---|---|---|
| 10 ft. | 79 | [illegible] |
| 12 " | 113 | 13 |
| 14 " | 154 | 17 |
| 16 " | 201 | 22 |
| 18 " | 254 | 28 |
| 20 " | 314 | 35 |
| 22 " | 380 | 42 |
| 24 " | 452 | 50 |

Knowing the diameter of silo best adapted to a particular farm, the height must then be calculated from the ensilage to be stored. This, in turn, depends upon the number of farm animals to be fed, and the daily allowance of ensilage to each animal.

The amount of corn ensilage generally fed daily to different farm animals can be found in Table II. By aid of this table there can be found the number of tons of ensilage to be stored annually.

Table II

| Kind of stock | Amount of corn ensilage [illegible] |
|---|---|
| Dairy cows | 30 to 45 lbs. |
| Beef cattle | 25 to 40 " |
| Young stock cattle | 10 to 20 " |
| Horses and mules | 10 to 15 " |
| Sheep | 3 to 5 " |
| Stock hogs | 4 to 6 " |
| Chickens | All they will eat |

A group of 3 tile silos, with common feed room and chute arranged between them

In calculating the storage capacity of a silo in tons, the averages found in Table III will be safe:

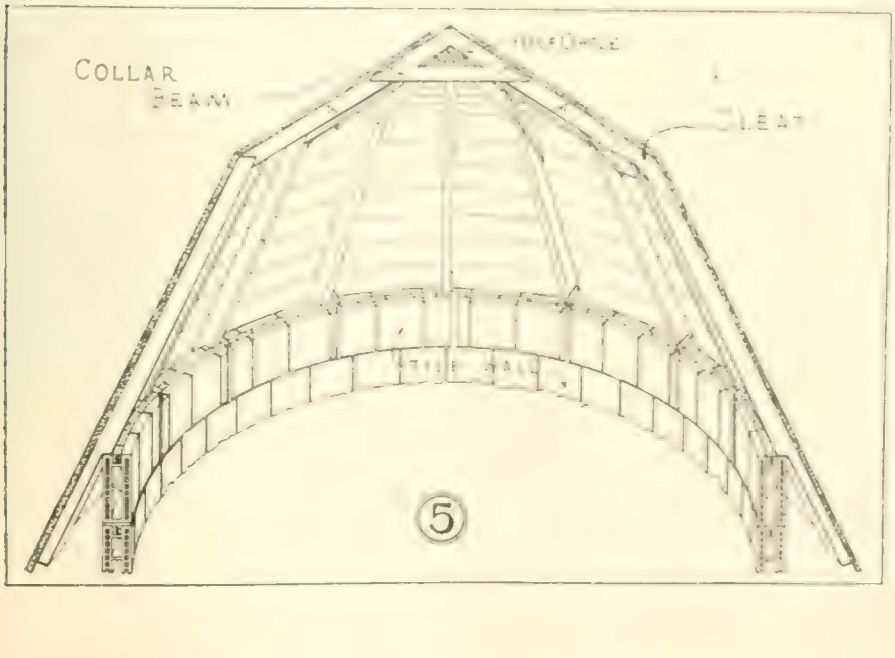
Table III

| [illegible] | [illegible] |
|---|---|
| 10 ft. | 1.6 tons |
| 12 " | 2.5 " |
| 14 " | 3.25 " |
| 16 " | 4.25 " |
| 18 " | 5.25 " |
| 20 " | 6.5 " |

As it is necessary in operation to climb to the top of the ensilage every day, and to feed the stock from the top, two features are necessary in a silo which have not been touched upon yet. One of these is a built-in iron ladder, as shown in Fig. 2. It will be observed that the hooks at the ends of the rungs are locked back of the reinforcing steel bands, where they are bedded in cement mortar. The other feature is a series of doors which are fitted tightly from the third course from the bottom to the top of the silo. As the ensilage is lowered in the silo, these doors are removed so ensilage from the top can be thrown down to the feed room through the chute. A covered chute, which may be of either hollow tile or wood, is built to the silo, and this opens out into a feed room built against the barn. The layout of this detail may be studied in Fig. 3. By this arrangement the farm help can pass from the stock barn through the feed room and up the ladder in the chute to the top of the ensilage in the silo without being exposed to the weather, and in like manner the ensilage can be delivered to the stock through covered passageways, and less risk be run of its being frozen or washed free of its juices by frost or rain.

In Fig. 4 can be seen a silo, chute and feed room all of hollow tile. The open end of the feed room is to be built against the barn wall. The framing for the roof of the silo can be seen in Fig. 5. Rafter ties are placed as shown in the illustration when laying the top course of tile. The ties are spaced by measuring the distance around the silo, and dividing this space by the number of rafters. There are always two more rafters than there are feet in the diameter of the silo. That is, a 10-ft. silo would have 12 rafters.

The method of putting up the roof frame is plainly shown. The two longer rafters, marked A-A, are put up first, and the half-circles and collar beams nailed to them. The other rafters are nailed to the half-circles at the top. No plate is used, it will be observed, but each rafter rests on the outer shell of the hollow tile building block. As there is liable to be a slight variation in the top level of the various blocks, the rafters should be framed with that difference in view, or else they will have to be wedged up to a common level; otherwise a "wavy" roof line might result, if the variation in the level of the several tile should happen to be great.



Detail showing construction of silo roof. The rafters are tied to the wall by iron straps built into the top course of tile

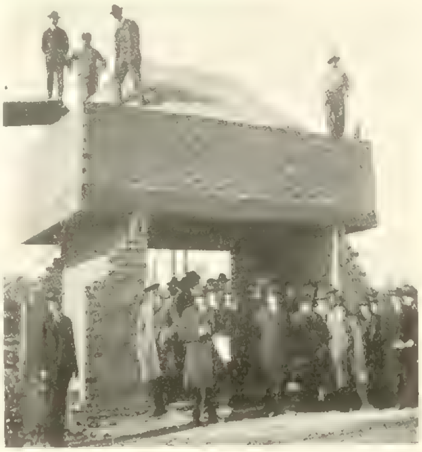
# Building Officials' Conference

## Visits to building material plants a feature. High construction costs increase interest in codes

THERE was perhaps more than the usual interest attached this year to the annual meeting of the building officials of the country, because of the importance of the attitude of master builders and the effect of building codes on the cost of construction. In normal times students of the building industry recognized the wide differences of requirements for good construction between one city and another, but in these days, when every help must be given the industry, everyone realizes that it is necessary to recognize all types of construction that are safe within necessary limitations and tend to reduce costs.

This is considered so important a factor in getting construction under way again that the Department of Commerce, under Secretary Hoover, will shortly undertake a study of building codes with the purpose of formulating minimum standards that will be suggested for adoption by cities and towns throughout the country.

The conference was held in Cleveland, Ohio, on April 27 and 28, at Massillon on the 29th, and at Youngstown on the 30th. The several locations were decided upon to give the officials opportunity to visit plants where building materials of modern type are manufactured. Thus hollow tile plants were visited in the vicinity of Cleveland and at Massillon a pressed steel plant where “metal lumber” is made, following which a general discussion was held and a visit made to several buildings under construction with this material. At Youngstown a visit was made to another large steel plant where steel sash, “metal lumber” reinforcing bars, metal domes, metal lath and similar products were seen.



**View of the walls of common brick laid on edge, with air space, that were tested at Building Officials' Conference**

One detail of particular interest, in view of the present necessity of reducing construction costs, was a test of the new 8-in. hollow brick wall developed by the Common Brick Manufacturers' Association, which the delegates witnessed at the invitation of the Association. This new brick wall is briefly described as built of brick laid on edge, instead of flat-wise as normally. In the 8-in. wall there is a 4-in. space in the center and the headers running through at intervals, according to the weight on the wall, bond the two sections together. In the illustration of the walls which were tested, the upper parapet shows the typical “all-rolok” bond, which it is claimed requires 25% less brick, only half as much mortar and less labor than the solid wall.

**Building Officials in convention at Massillon, Ohio**

# SHOPWORK *and* FURNITURE

## Designs for the Finish Man

# A Corner Fireplace Mantel

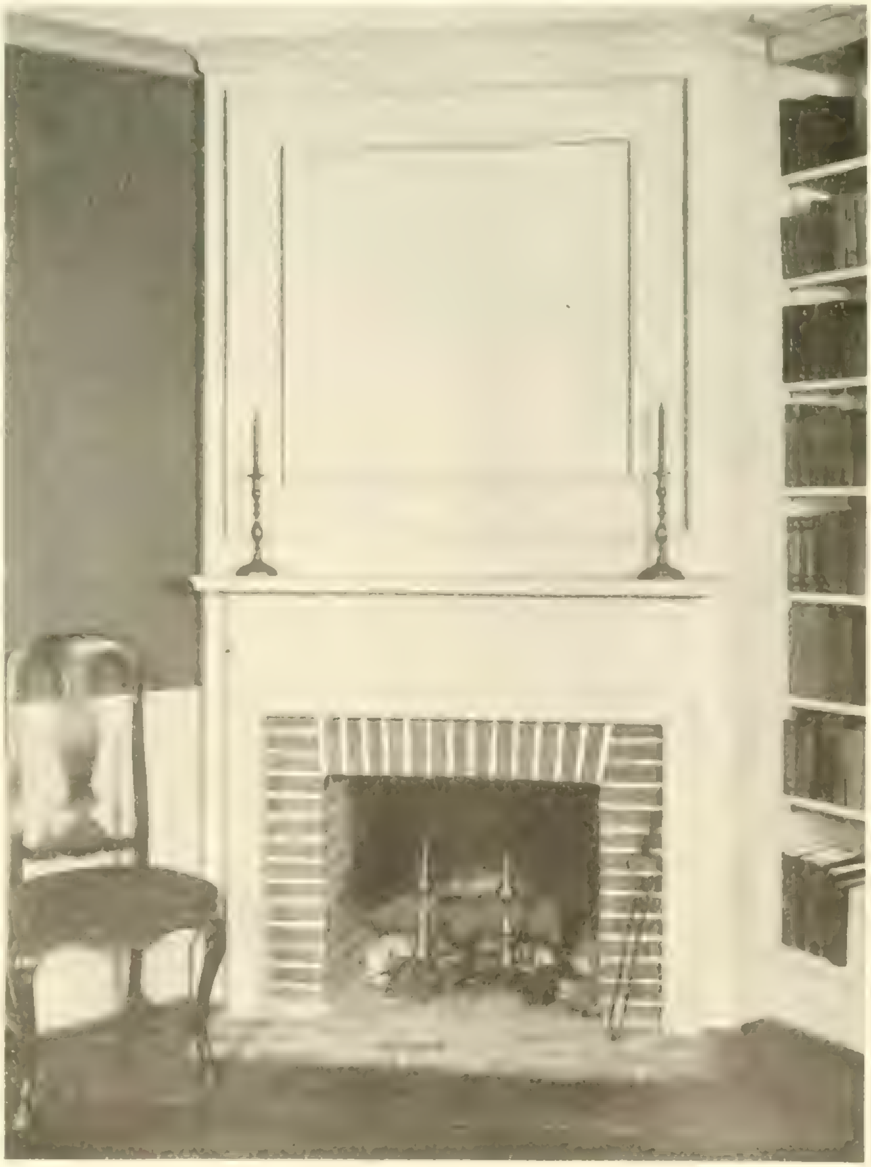
*With special drawings from the designs of*
*Dwight James Baum, Architect*

WORKING drawings of mantels are among the most important of the details of interiors which the builder needs. A customer is easily impressed when he is shown an illustration of a tasteful, well designed mantel, and realizes that the builder is ready to produce the same thing, with all its delicacy and refinement, and to install it, complete and ready for use, in his house. The difficulty is generally in obtaining the details which it is necessary for the Finish Man to have. Illustrations in books or magazines often show excellent examples of such woodwork, but without the essential details it is almost always impossible for a builder to produce a copy which would satisfy the customer.

Here is an illustration of a corner mantel, with bookshelves, which is in the best of taste and calculated to please the most exacting of customers, and upon the next page are given all the details, carefully drawn to scale, which are required to build it in any woodworking shop.

The Finish Man who is trained to appreciate good proportions will at once note the manner in which the fireplace is set into the corner to provide an ending for the bookshelves, and the space between where the shelves end and the breast of the mantel begins. All detail of the bookshelves is extremely simple, and no glass is used, which makes for economy and also makes possible that the full note of color or ornament be supplied by the books. The cornice over the mantel is continued about the room, tying the mantel into the room in an effective manner. Fillets used in each of the moulded portions are of great delicacy, particularly in the recesses of the 5 panels below the shelf, and a refreshing variation from the usual pilasters is supplied by the use of the decorative trim of reeding, which may be had of composition and bought from stock.

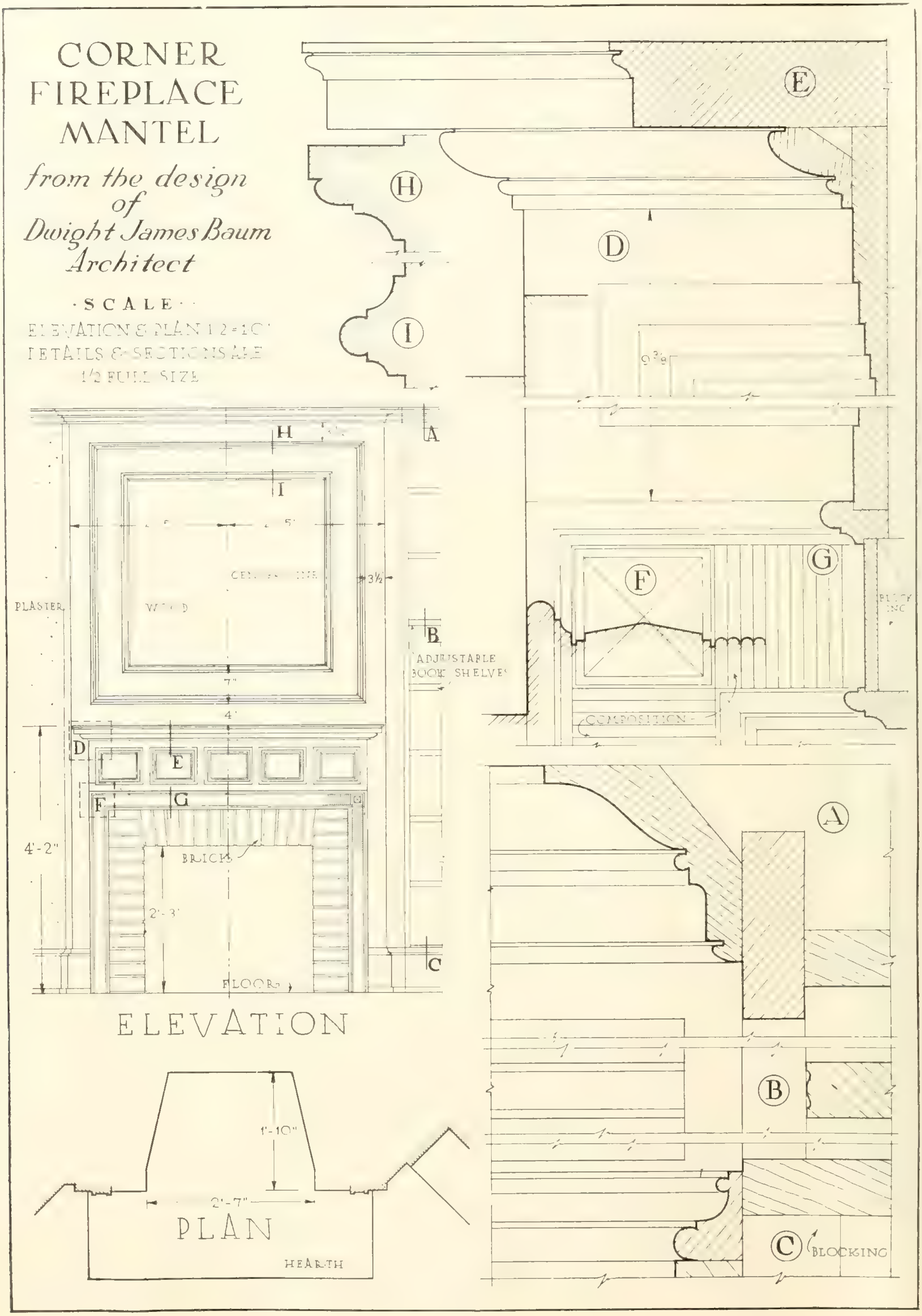
The large, simple panel over the mantel is intended to be of wood, built-up and veneered to give the appearance of one solid board. Where this treatment could not be carried out the effect might be closely imitated by covering the wall with linen or canvas, fitting stiles or mouldings to create the paneled effect, and then painting the entire work, both panels and stiles.



# CORNER FIREPLACE MANTEL

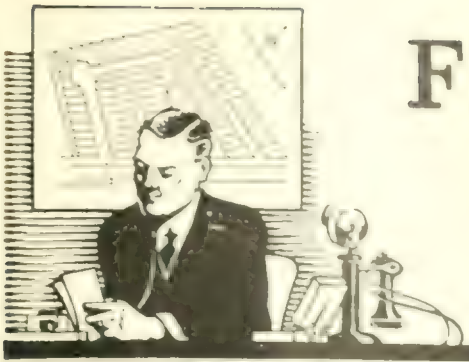
*from the design of Dwight James Baum Architect*

SCALE
ELEVATION & PLAN 1/2"=1'0"
DETAILS & SECTIONS ARE 1/2 FULL SIZE



ELEVATION

PLAN



# FINANCE and REAL ESTATE

## Helpful Data for the Builder Who Builds to Sell

# The Business of Speculative Home Building

## Part III. Careful planning to create sales value

*By C. Stanley Taylor, Associate Editor*

> **This is the third of a series of articles which are running through a number of issues giving a concise and detailed account of the many problems entering into speculative home building. The first of these articles covered the subject of "Suburban Land Development"; the second, "The Development of City Plots."**
>
> **It was planned to run an article on financing speculative building operations in this issue. Owing to the importance of careful planning as a help in obtaining financing, the editors feel that this subject should be presented first. The article on financing will, therefore, appear in the July number.**

THE most important period of any speculative building project is the time during which the questions of land improvement and building plans are being considered and developed. This is the time when money is really made or lost in this business. If we may judge by the results of speculative home building throughout this country during the past few years, it is quite evident that the average builder has given too little attention to the possibilities of developing sales value.

It may be said in a general way that successful speculative home building caters principally to the eye and to the sense of comfort and utility. The aim of the speculative builder should be, therefore, to provide every inducement of this kind which is possible within the cost limit.

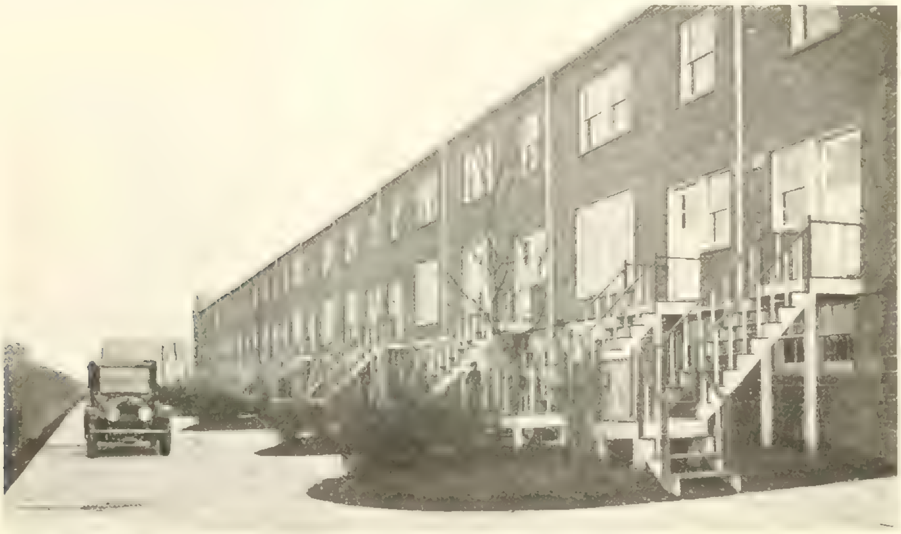
To buy the cheapest of materials and equipment and to introduce cheap methods of construction may result in the building of houses which can be placed on the market at comparatively low prices. In some instances this practice has been successful, but for the builder who wishes to stay in business it is far better to produce buildings of good construction, which embody careful study and economy in land and building arrangements. This will result in satisfaction on the part of the purchaser, and it is usually found that the profit from well built and well planned residential developments is greater than that resulting from cheap speculative building.

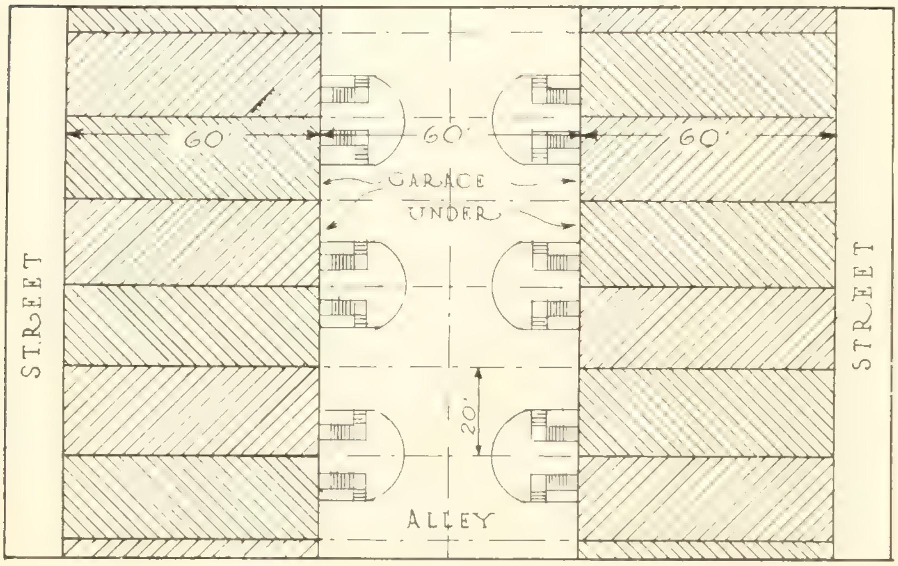
This statement is made not only in view of conditions during the past few years, but also because of the changing demand and the constant raising of the standards of living of the American people. Years ago the cheap, shoddy housing developments were successful money makers; today they constitute the slum districts of our cities and towns. As we pass through these sometimes extensive residential areas and note how quickly they have deteriorated, we must realize that the speculative builder of the past has seldom realized his responsibility to the community. We wonder who financed the construction of the long rows of cheap, unsanitary houses, and how much real profit was made in such operations.

### Land Efficiency

Turning then to speculative developments where more thought was given to the question of planning before the houses were built, it is apparent that the first element to receive consideration has been the question of land improvement and use. This is the first problem which the speculative builder faces. He owns a tract of land on which he wishes to build residences for which there will be a ready market. How shall he divide this land? Methods of determining the logical sizes of lots allowable for houses of given costs have been discussed in previous chapters. As already pointed out, the approximate basis on which to determine the size of lot is the plan by which its value shall represent approximately 20% of the value of the house. Having determined the size of the lot, the next question is that of the improvements with which it is to be provided. Such property may be located in the suburbs of a large city, in a smaller town, or it may be property within close transportation distance from the business section of a large city.

The wise speculative builder, having determined the sizes of lots which are available for the class of dwellings which he intends to erect, will then analyze carefully the possibilities of their use. For example, he may prefer a development of semi-detached houses laid out in such a manner that individual dwellings and garages are located on lots of from 20 to 22 ft. in width, such as are described in another article in this issue of THE BUILDERS' JOURNAL. Ordinarily, given such restricted lot sizes, resulting from comparatively high land values, the speculative builder might have placed on this land a series of row houses, more or less monotonous in design, and possibly with garages approached through an alley at the rear. In this development, however, one very important fact has been realized—that the type of house which is built for sale today must not only be suitable in price and utility features for the neighborhood in which it is located, but that it should be unusual in some features of planning or equipment in order that it may have the sales value which always belongs to an unusual





**A good arrangement of city row houses on shallow lots, with a wide alley in the center of the block to give access to individual garages in the basements**

piece of merchandise. An examination of these illustrations and plans shows that the purchaser obtains a dwelling which is practically individual in all features, having access to the rear through a driveway beside the house, and providing a garage for individual use, although it is a unit of a larger building.

There are other instances which should prove interesting. For years, in a certain part of Brooklyn, extensive speculative home building has been carried on, using lots from 20 to 25 ft. in width, sometimes developed with row houses and sometimes with narrow individual dwellings. The lots were usually over 100 ft. in depth, and as one development followed another the entire section was built up with houses costing from $3000 or $5000, on land worth from $1500 to $2000 a lot. Then came the wise speculative builder, who spent more time in planning and, as a result, less time in selling. He bought an entire block and replanned it with a number of private cross streets, making lots only 60 ft. deep. On these he built row houses with fronts made individual by variations of brick color and texture, and by varying the mouldings of the cornices, types of entrance doors, window openings, etc. The money which was saved on cutting down the sizes of the lots was put into extra "trimmings," with the result that these houses sold almost as fast as they were built—and at a higher profit, per house, than builders in that section had ever known.

It may readily be seen that careful consideration of the use of land is of great importance. In some suburban sections there is a definite problem involved, in case of a larger lot, as to the placing of the house. Sometimes, if it is a long narrow structure, the long dimension may be placed parallel with the street. This is often done with English and Dutch colonial types of houses, and results in an attractive arrangement which increases sales value. Again, there may be trees on the property, or a small spring, or other features of which advantage should be taken in locating the building. The speculative builder who usually succeeds is the man who has the ability to visualize a finished job, or who has the courage to admit his own lack of knowledge and the wisdom to employ an architect who may supply the missing knowledge. We come naturally, therefore, to the consideration of a topic which has been discussed many times and on which speculative builders hold a wide diversion of opinions.

## The Value of Architectural Service

The first question under this heading is, naturally, whether or not the home buying public demands good architectural design. Public taste in buildings, particularly in dwellings, during the past ages has run somewhat in cycles. It has developed more broadly as means of communication have been extended. To explain this we have but to go back to the colonial days, when several of our popular styles of American domestic architecture were evolved. We might say here that the term "colonial" is badly misused. There is really no such thing as a colonial house, but rather a house is of English colonial (commonly called "colonial"), or Dutch colonial, Swedish colonial or Spanish colonial—depending entirely upon the home building style developed in each of the early colonies and based on ideas brought by the colonists from their mother countries. For many years, in the various sections of this country which were first colonized, the homes of the people followed in each section a more or less carefully developed school of architecture. This was perhaps not due to any great elevation of public taste (although the pride of craftsmanship entered here to an astonishing degree), but was due to the examples of the first well constructed homes of the better and wealthier classes in each colony. As the population of the country grew, these sections extended and combined. Means of communication and travel were also being broadened. Immigration brought its contribution of home building ideas from all the civilized world. In the

United States 25 years ago, comment- ing on the [illegible] conditions of public taste. In dwelling design very difficult to describe.

The wave of speculative building which passed over the country at about that time, did not reflect any high order of public taste. The speculative builders did not consider the value of good architecture, as it had not been demanded by the public. Thus we find many of our older residential communities consisting of several unattractive classes of dwellings. In the cheaper districts there were built houses which looked like shapeless boxes, and the districts of the better residential type flaunted the jig-saw puzzles of "Queen Anne" and similar architectural monstrosities. Until the last decade there had been little attempt to consider a residential district as a whole, and from the viewpoint of well designed blocks and resulting unity of mass. In the last few years, however, there has been clearly developed in the United States a definite artistic perception on the part of the American home owning public. This is largely due to information which has been disseminated constantly through magazines and newspapers. It is also a fact that in this country artistic perception and appreciation have increased through more extensive reading, and because of more extensive traveling. Evidently, therefore, the public is in its first stage of demanding dwellings of better design. The ugly row houses and the "gingerbread" structures of past years offer no inducement to the wise speculative builder today. He is carefully studying his buying public.

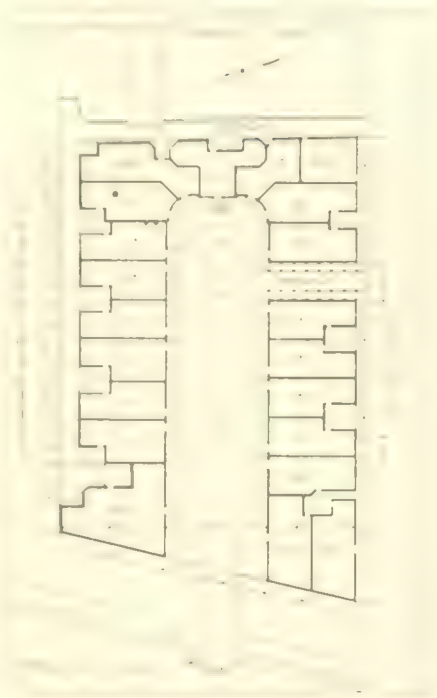
With the fact established that this public demands houses of better design, it must also be appreciated that the higher standards of living demand greater comfort and utility. Thus it has been found that even in the development of modern industrial villages, the building of a home has become a complex operation, requiring a full knowledge of available materials, equipment and utility devices.

The speculative builder today has two courses which he may follow. In moderate cost housing there have been made available through architectural competitions, magazines, newspapers, and various special services, thousands of stock plans of well designed dwellings for which working drawings and specifications are available. An example of this type of service may be found in every issue of THE BUILDERS' JOURNAL. Here is the builder's opportunity, therefore, to get plans which have at least architectural merit and which will probably meet the demand of the buying public. This is the [illegible] to the builder [illegible] the community where he expects to build.

The other method, which is strongly advised, is the employment of an architect. [illegible] have taken special interest in the design of attractive small houses. This is what an architect can do for a speculative building development:

1. Work with the owner in laying out land and deciding on improvements.
2. Arrange a plot plan and locations of the houses in such a manner that the entire group is studied *en masse*, to gain unity and a measure of attractiveness for the entire development. This adds definitely to the sales value of the individual houses.
3. Design attractive dwellings, which represent maximum sales value at minimum cost.
4. Provide modern equipment which will appeal to the buyer.
5. Give the simple finishing touches and planting, which are so important from the sales viewpoint.

The importance of good planning is not only proven through the medium of increased sales value, but is evident when first application is made for building and permanent loans, when loans from financial institutions are necessary. Not long ago we requested information on this subject from the president of one of the large building loan organizations. He informed us that his organization not only passed more readily on loans where plans



Above is a lot plan and below a view into the large court of a city house group in Boston, showing an unusual way of using a deep plot for row houses of individual type. The court gives dignity and quiet. Frank A. Bourne, architect

were prepared by an architect, but that the plans of certain architects always called for a somewhat higher appraisal. There are several reasons for this condition, the first being that the plans and specifications prepared by an architect, when submitted with a building loan application, are certain to give the complete information required. Consequently, it is much easier to appraise the value of the buildings. Naturally, when an architect's name becomes known to loaning institutions as being identified with the design of dwellings which appeal successfully to buyers, it is but natural that growing confidence should be placed in the ability of the particular architect in question.

The value of architectural service is again to be realized through the provision of unusual features of design and equipment. It can be readily understood why unusual details will help to sell a house. The fact that the owner will have something "different" immediately adds to its value in his mind. If there are features of convenience and comfort which he may not have enjoyed before, there is definite appeal in this fact to the prospective purchaser; the provision of adequate electric outlets and possibly one or two special electrical features, studied arrangement of the kitchen from the viewpoint of reducing household labor;—all this appeals directly to the woman who, 9 times out of 10, decides whether or not a purchase contract will be signed.

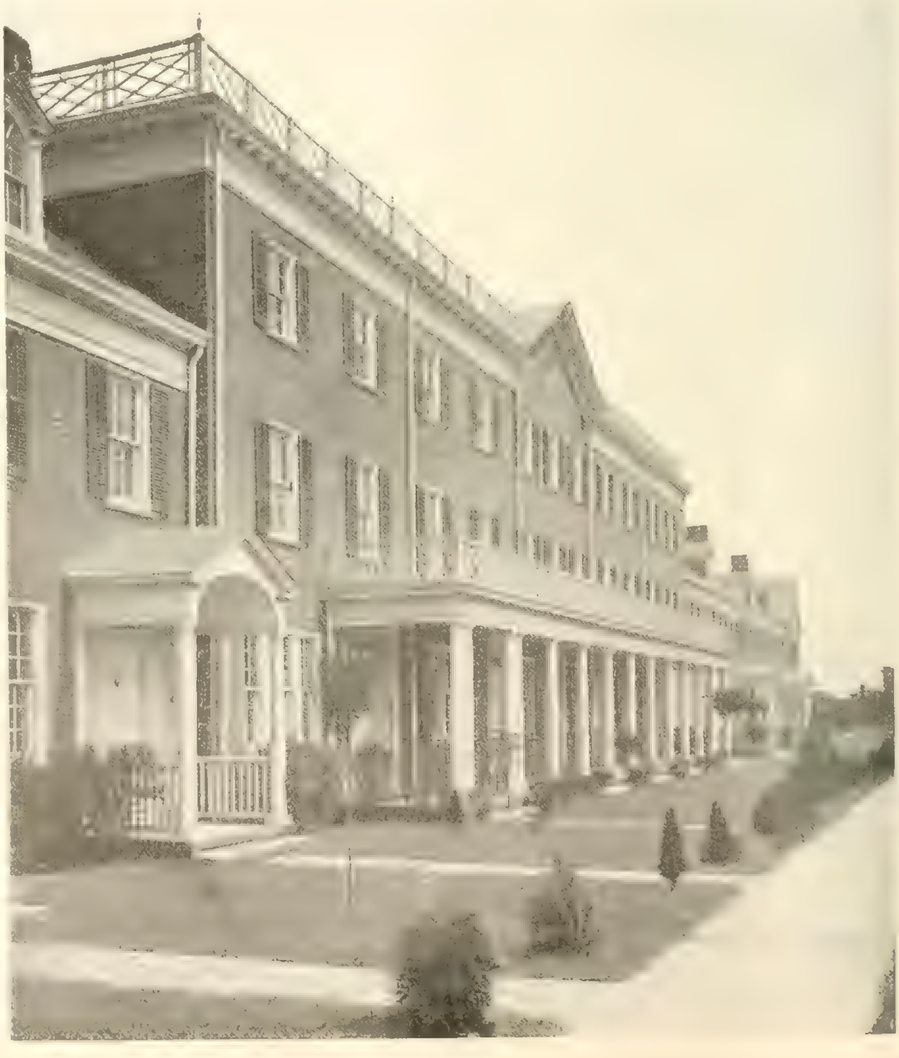
### The Garage as Standard Equipment

A recent statement of the number of automobiles in use in this country shows that some type of motor-driven vehicle is owned by at least 1 out of every 3 families. This fact, coupled with the experience of many speculative builders during the past few years, demonstrates clearly that the garage has become a standard part of the equipment of the speculatively built dwelling. In fact the inclusion of a garage in the general design of any speculative dwelling property has become an exceedingly interesting problem, particularly where the unit of land is small. In another article in this issue we have shown one method of providing an individual garage on a small lot. In the May issue of THE BUILDERS' JOURNAL we presented a different solution of the same problem, which involved a rear alley entrance to the property with ramps leading down to garages located in the rears of the basements of row houses. Other designs incorporate the garage with the house in one design. Naturally, where the lot is sufficiently large, the garage will be placed away from the house. The cost of building a garage is not high, particularly as it is often possible to use most of the left over material. A garage easily adds twice its own cost to the selling value of any residential property.

### Valuable Finishing Touches

Andrew Carnegie once said if he had only $5 left, he would use it to purchase a silk hat. He realized the sales value of impression—particularly of first impression. The finishing touches on property developed as a speculative home building project include those elements which must appeal directly to the eye. The driveways to the garage should be paved, even though this be done merely by running out two narrow strips of cement. Sidewalks and approaches should be complete and all ground spots should be carefully sodded. From $25 to $50 spent in the purchase of a few ornamental trees and shrubs will add $500 to the appearance, and consequently to the sales value, of any house. Window boxes and trellises can be made on the premises by a carpenter in a few hours. There are available all types of cast stone garden furniture. In fact the finishing touches, which have so much to do with the appeal to the purchaser, represent a minimum of cost. Nowhere about the house can money be so well invested from the speculative builder's viewpoint.

In this article we have endeavored to direct the attention of future builders to the definite importance of carefully analyzing all plans before actual construction is begun. We may repeat here, as a matter of emphasis, that the profits and the losses of any speculative building project are practically determined during the planning period.



**A long block of row houses in which variety has been given by different cornice heights, gables on the ends and varied porches. Electus D. Litchfield, architect**

# The Five-Room Bungalow

## A widely popular type of modern house; economical in construction and convenient for the housewife

### *By William Draper Brinckloe, Architect*

A LETTER lies on my desk,—from the editor of a well known household magazine. I'll read you a few lines:

"I have just been talking to a prominent architect; he says that the story-and-a-half house, with bedrooms upstairs, is by all odds the favorite, nowadays."

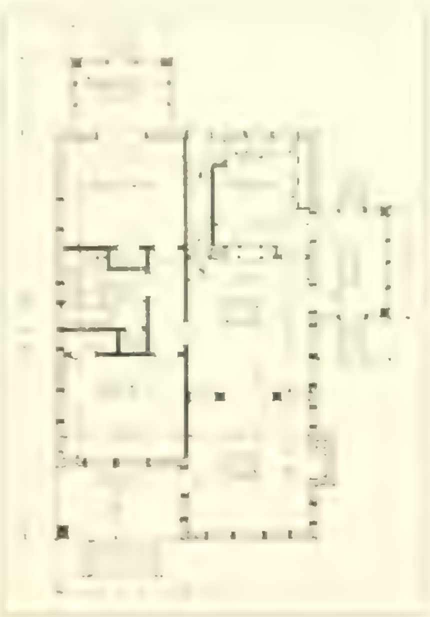
Well, I think that *is* the belief of most members of my profession; I know it was *my* belief until very lately. But a few weeks ago I conducted a contest, "The Small-town House," for *The People's Popular Monthly*, of Des Moines, Iowa, a magazine with a national circulation of about 350,000. The sketches received came from all over the country, and they showed beyond all question that the strictly 1-story bungalow, of 5 rooms, is the favorite, by a big majority, with small town folk. The story-and-a-half house represented less than one-fifth of the total number of plans.

So I am sure that the architect or builder, who is going after the small-town business, will be glad to know what small-town folk really want. Let's look at Figs. 1 and 2, the exterior and plan of a little bungalow in a small town on the Atlantic coast. There is no finished attic, but merely some storage room for trunks and so on. The floor plan is thoroughly typical of a house of this class;—"Just what I want!" the average housewife will say. The little passage way, giving privacy to the bedrooms and the baths, is the particular feature of this layout; a bedroom opening directly off a living room is distasteful to many women, I have found.

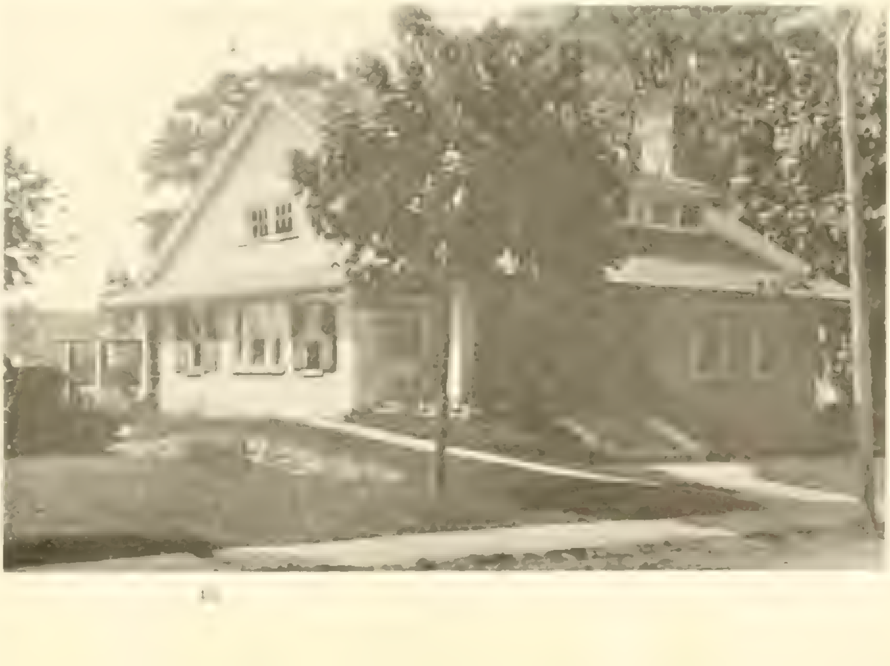
The sleeping porch may or may not be wanted, but it is very inexpensive to build, and really adds an extra room for guests, besides being useful in cases of illness. The best way to build such a first story sleeping porch is to weatherboard it up for about 4 ft. 6 ins., then frame the openings to such sizes that 6-light sash, 8 x 10 glass, may be fitted for winter or as protection against storms. These sash can be set in from the inside and held by buttons or bolts; flyscreen netting is tacked over the outsides of the openings. I have such a porch on my own home and it works well, winter or summer.

Usually, the kitchen of a small house receives far too little attention from the architect or builder, whereas the average housewife will spend more time and study in planning the kitchen than she gives to all the rest of the house put together. I haven't space here to discuss the subject of kitchen equipment,—cupboards, floors, and so on, but I hope to go into it thoroughly in a future article. A well equipped kitchen has sold many a house! Only, let me say that the pantry is almost obsolete; food cupboards built around the kitchen, right at hand, are what is wanted nowadays. Above all, don't put a "butler's pantry" between kitchen and dining room; this affectation is a relic of the days when servants were plentiful and cheap.

The breakfast porch is a very popular feature, especially if glazed-in for winter. A dining room needs more cleaning and sweeping than any other room in the house, excepting possibly the kitchen; a breakfast porch is far easier to keep neat. I am speaking from personal experience, here. Two-thirds of the meals in my own home are served on the breakfast porch. In this particular plan, the porch serves another purpose, too; it is, to some extent, a *kitchen* porch. The "grade door" on the cellar stairway is something that many women are demanding, these days; the ordinary, old fashioned, cellar doors are heavy, awkward and inconvenient. If the lot



Figs. 1 and 2. A 5-room bungalow with stucco exterior that shows the dignity of simple design. Note the convenient plan, the bedrooms separate from living quarters



**A hip-roof bungalow with corner recessed porch, similar to that in Fig. 1**

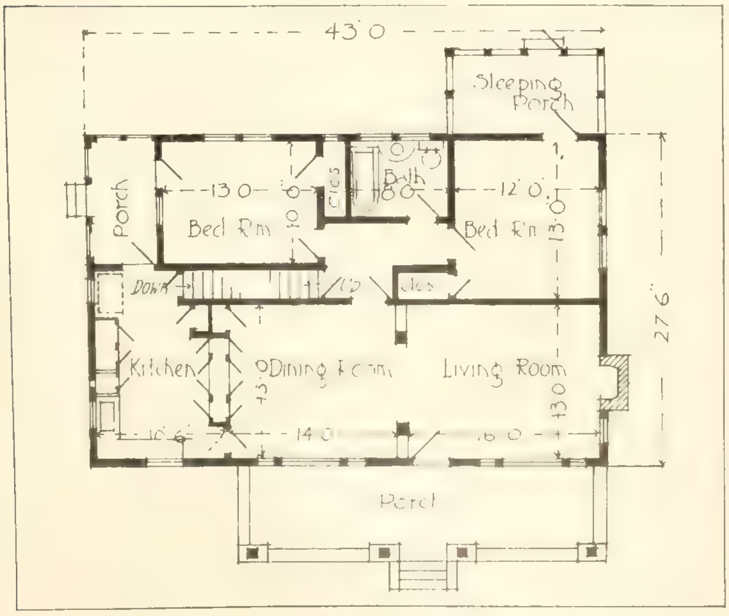
is wide enough, we can use a layout as is shown in Figs. 3 and 4; a Pacific coast bungalow. In the original, there was no cellar, but I've drawn stairs going down under the front stairway. In colder climates a flue must be added to the fireplace chimney to take care of the furnace or boiler. Where there is no gas supply, another chimney must be put in the kitchen for a coal range.

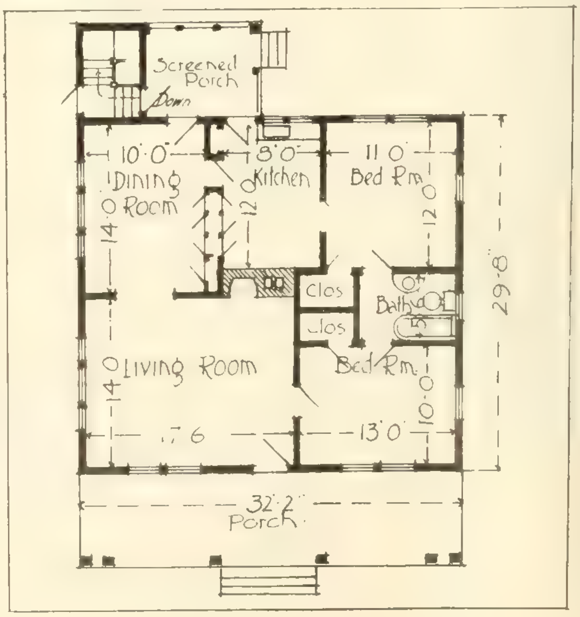
Now, let's look at another plan,—Fig. 5. In this case, the passage is left out and the bathroom communicates directly with both bedrooms. Many women are entirely satisfied with such a plan, I have found, for though there is perhaps less privacy, it is more than made up for by the greater compactness and lower cost. The fact that the rear bedroom is entered through the kitchen may be a serious objection to some people, but others really prefer this. The housewife can start breakfast, and then keep an eye on it while she dresses; a baby can be put down for a nap, close at hand; an invalid can be nursed without interfering much with the work, and so on.

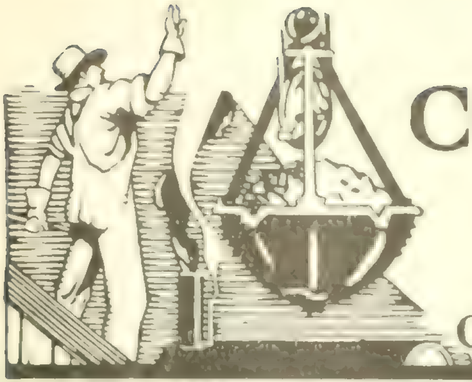
But, by a little shifting of Fig. 2, we can get the compact plan, and still have a dining room entrance to the rear bedroom. Slide the whole left hand half of the plan forward 8 ft. and put the closets where the passage is; build the sleeping porch into the body of the house, behind the rear bedroom, and put the front porch in front of the whole house. Now you can cut a door from dining room to rear bedroom.

Of course there are any number of other variations that can be made, but a small-town woman will choose one or another of the plans I have shown here, six times out of ten, for the general layout of her home;—just see if she doesn't!

**Figs. 3 and 4. A Pacific coast bungalow with long side to the street. Fig. 5, below at right, shows a compact plan, less expensive to build**







## CONTRACTING EQUIPMENT

### Reliable Information on Time and Labor Saving Devices

# Chuting Plants on Work of Moderate Size

*By Harold C. Bond*
*Sec. Waldo Bros. & Bond Co., Boston*

CHUTING plants for the distribution of concrete have been in general use for approximately 10 years, and are now an accepted part of the equipment required on jobs where a large volume of concrete is to be handled. It is not commonly realized, however, that the economies which have established their desirability on massed operations can also be obtained to a considerable degree on many projects of moderate size.

The theory of the chuting plant is based upon the principle of elevating the mixed concrete to a sufficient height so that it will flow by gravity to the point where it is to be used, thus eliminating the expense of conveying it in wheelbarrows or carts from the place of mixing to the place of actual use. At first many engineers were skeptical regarding the use of chutes, fearing that the elements in the concrete would separate and a loss of strength result. Time has demonstrated that such is not the case, however, and experts now assert that the ability to flow properly through a chute line is a good proof of the proper proportioning of the ingredients of the concrete.

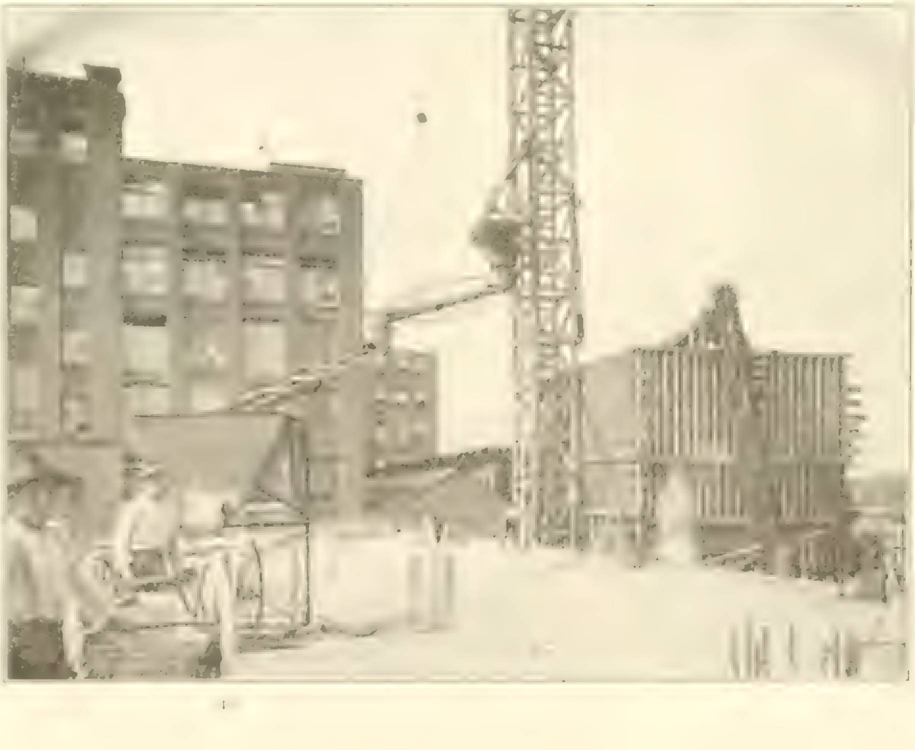
A typical chuting plant includes:

1. The tower, constructed of wood or steel.
2. The bucket, running within the tower, for raising concrete.
3. The tower hopper, into which the bucket dumps.
4. Two or more lengths of chuting, leading from the hopper and joined by flexible connections.
5. Sheaves and rope, required to hoist the bucket.
6. The hoisting engine,—steam, electric or gasolene.

Other equipment, such as bins for the storage of the aggregate, fed by a bucket elevator and so constructed as to discharge directly into the mixer, can well be employed whenever the size and conditions of the job are favorable to their use. To avoid the necessity of constantly shifting the positions of the chute lines, it is also becoming the usual practice to erect a floor hopper at the end of the chute line, and to place the concrete with barrows or carts from that point, rather than to pour from the chutes directly into forms. A great deal depends upon the proper co-ordination of the different units, selection of the most advantageous location for the tower, the method of handling loose materials, and similar considerations. It is not at all unusual for the representative of a house which specializes on concrete-handling equipment to make suggestions which prove of immense help to contractors. This is strikingly illustrated in Fig. 4 which shows a blue print of a suggested layout as worked out by a salesman, and the plant itself which was built up therefrom. The project involved was the erection of a gymnasium building for the Phillips Academy, Exeter, N. H., a few years ago, and excellent results for both the contractor and the owners were obtained by following the plan submitted.

The question of plant layout offers one of the most fertile fields in all construction work for the exercise of ingenuity and judgment. Conditions vary widely, and many considerations may affect the ultimate decision. Take a long, narrow building, for instance. The simplest method would be to erect the tower half way of one of the long sides. But in the job illustrated by Fig. 2 both long sides were obstructed by existing buildings and the only

Fig. 1. View showing floor hopper from which barrows are filled



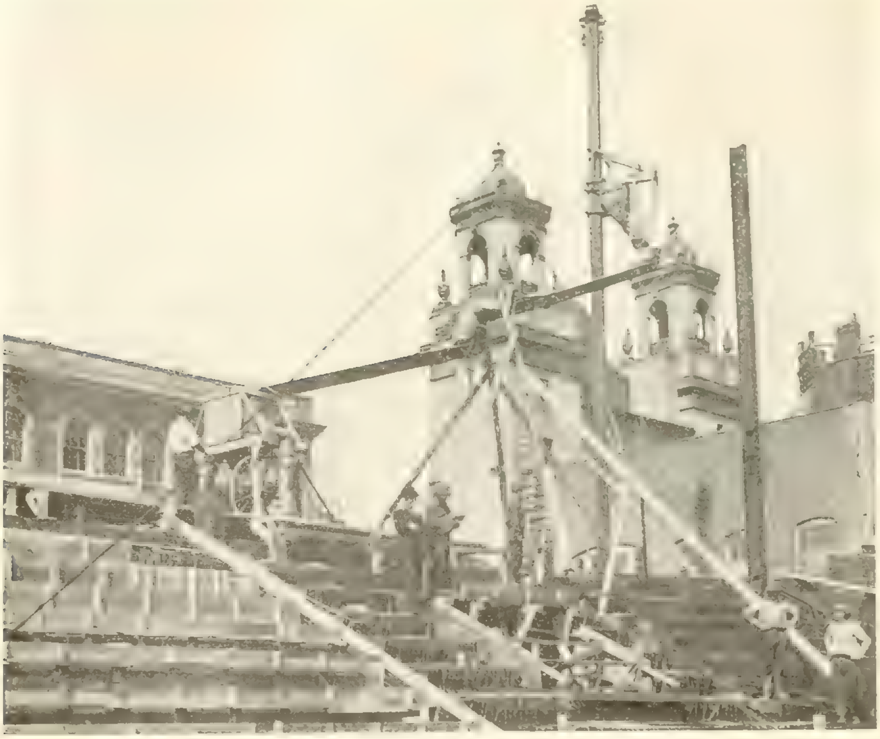


**Fig. 3. A special outfit for moderate cost work, where a timber mast replaces the tower**

available place for the tower was at one end, so that it was plainly necessary to chute the long way of the job. This problem was solved by the use of an overhead cable supporting several sections of straight-line chuting, thus bringing the main point of swivel to the center of the job, from which point the necessary flexibility of distribution was obtained. On another project, illustrated in Fig. 5, no direct access to the site could be had at all, owing to the presence of a river on one side, railroad tracks on another, and existing buildings on the others. A floating plant to operate from a barge on the river was considered, but the idea was discarded in favor of a plan by which the tower and mixer were located in an alleyway, with the chute line leading across the roof of the intervening building to a secondary tower which provided the support from which the flexible chutes could be led. Fig. 1 shows a typical, well laid out plant, employing overhead bins, bucket elevator, and floor hopper.

In making his choice of chuting equipment, the contractor should keep in mind that it is desirable to select units which are not only fitted for the work immediately at hand, but which are also sufficiently flexible to be adapted to larger or smaller work, of varying types, which he may have in the future. For this reason the most of this kind of equipment sold is of the standard type just described. There are, however, on the market at least two kinds of modifications, designed to handle smaller classes of work.

The first of these consists of a track built upon a light, inclined trestle which extends from the mixer out toward the center of the job. A flanged wheel car receives the concrete from the mixer and is pulled up the trestle by a hoist, which is a built-in part of the mixer and operated from the same engine. At the end of the track, the car discharges into a short chute line which is so hung as to be flexible and easily handled so that the concrete may flow directly to the place where it is wanted. On housing projects, and other small concrete foundation work, a plant of this nature is said

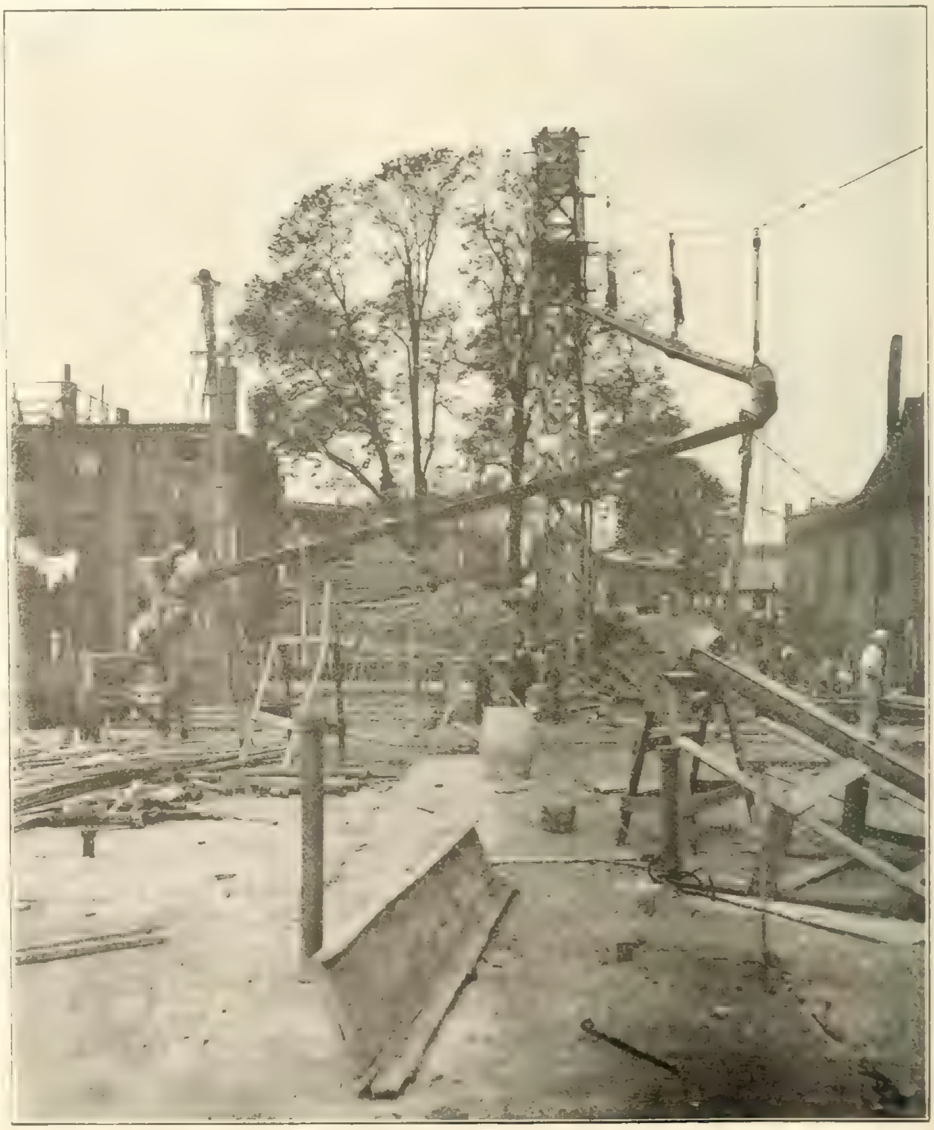


**Fig. 2. Plant layout at end of building because both long sides were obstructed. It is better, when possible, to chute from a long side**

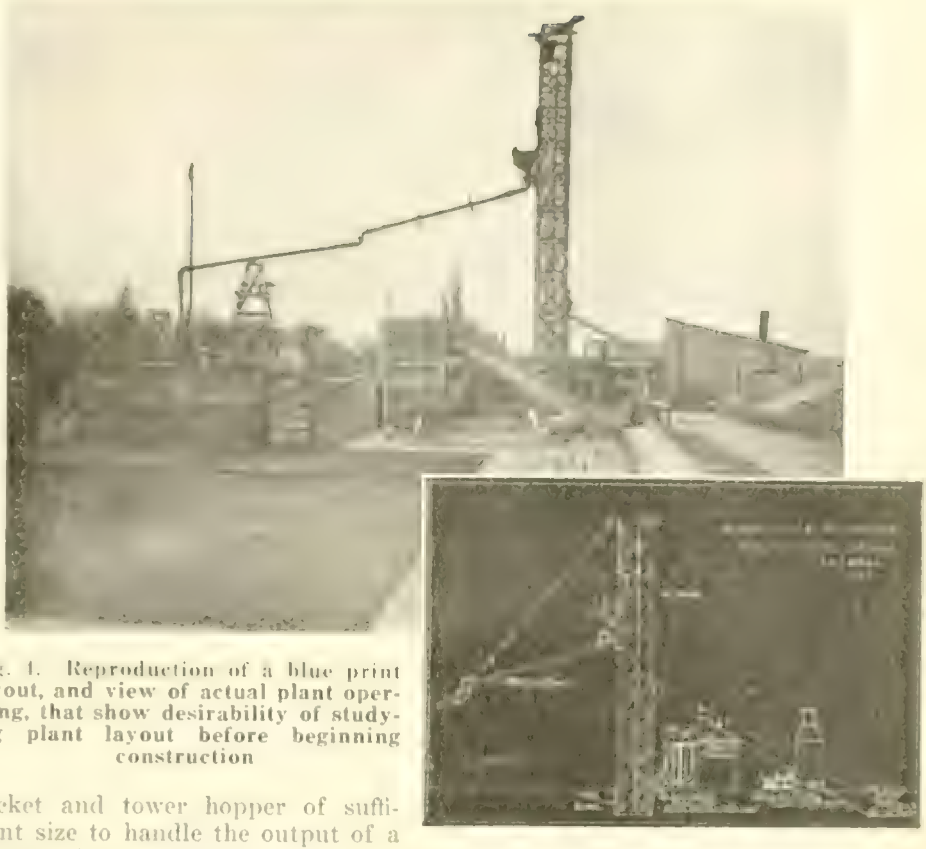


Fig. 1. Reproduction of a blue print layout, and view of actual plant operating, that show desirability of studying plant layout before beginning construction

to operate very well, with a saving in both time and the number of men needed.

The second type is similar to the standard outfits except that the bucket and hopper are so arranged that a single heavy timber, like the mast of a derrick, can be utilized in place of the regulation tower at a considerable saving in lumber and erection costs. Neither of these two outfits is recommended for jobs where larger than a 1-bag mixer is used. They both represent efforts to produce chuting plants which will be within the means of the small contractor.

Like nearly every kind of time- and labor-saving device, the chuting plant must be kept busy in order to achieve its purpose to the best advantage. Every shut-down, every delay, reduces its advantages over other methods, while the more constant its duty and the more steady the volume of work handled the greater its value is. For this reason it is always good management to forestall possible contingencies by providing larger facilities in the way of storage of materials than would be required by the immediate capacity of the concrete plant, so that in the event of interruption in the arrival of the materials the process of concreting can continue on schedule. A supply equal to 2 or 3 days' average run is generally considered sufficient and contractors usually figure the sizes of their bins, when that method of storage is used, on that basis.

A typical chuting layout of standard design, including an elevator bucket and tower hopper of sufficient size to handle the output of a 2-bag mixer, with the necessary sheaves and bearings for the top and foot of the tower and two 30-ft. chute sections with swivel connections to cover a 60-ft. radius, costs at present between $800 and $900. To this must be added the cost of building and erecting the tower which, if of wooden construction, bolted so that it can be readily dismantled and reassembled, will total approximately $8 to $10 per lineal foot of height. The expense of the hoisting engine must also be considered.

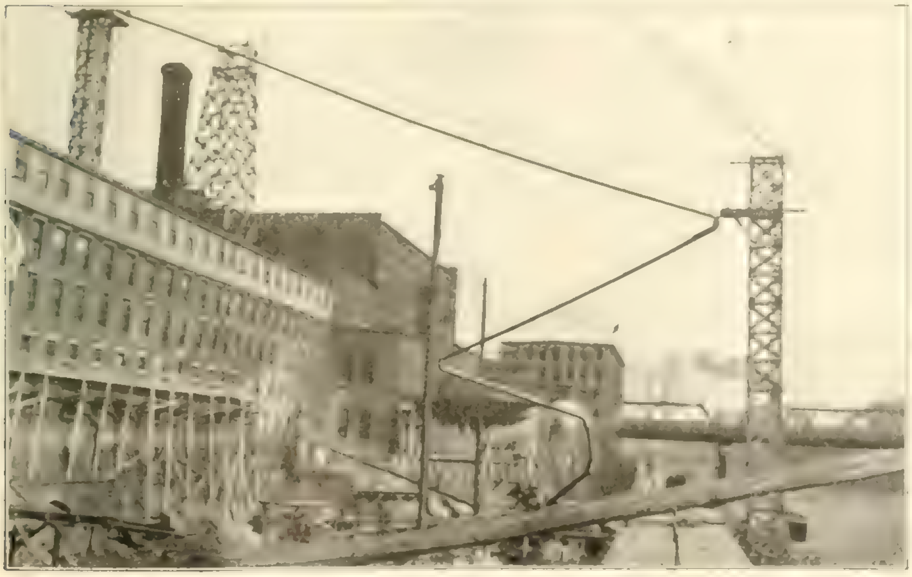
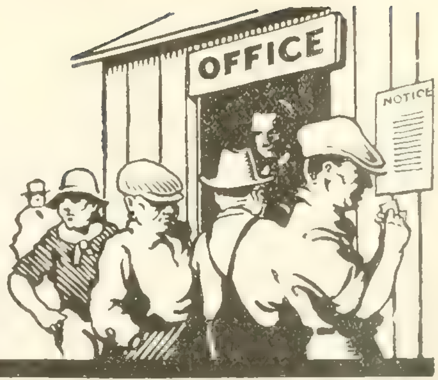


Fig. 5. View of plant with long carry over an intervening building, because of crowded space

It is the character of the contract, rather than its size, which determines whether such an expenditure would prove a good investment. If the volume of concrete is small, or scattered so that frequent shifting would be necessary, or if the distance to be covered is short, it is ordinarily a good deal better to get along with plain wheelbarrows than to erect a plant which may prove cumbersome, and an expense rather than an economy. At the same time, when conditions are right for the use of chutes, there is nothing more satisfactory in operation or more filled with possibilities for saving under intelligent handling.

If ordinary care is exercised, a chuting outfit can be used over and over again and its life prolonged for years. At the close of each day's run the elevator bucket should be sent up a few times filled with water to slush out thoroughly the particles of concrete which adhere to the interior of the hopper and chutes. Every effort should be made to prevent bumping the rounded surfaces of the chutes in handling, because dents which are thus made, unless repaired at once, form projections on the inside exposed to the grinding action of the flowing concrete and soon wear through. When the plant is dismantled, at the conclusion of the work, all the equipment should be thoroughly clean and coated with rust-resisting paint and stored with the parts plainly marked, in readiness for use on the next operation.

# OFFICE and JOB MANAGEMENT
## Things the other man has found out that save money

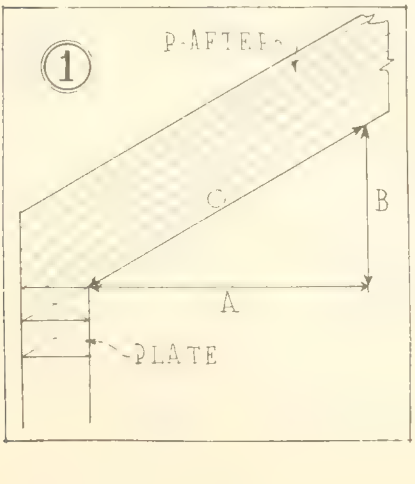


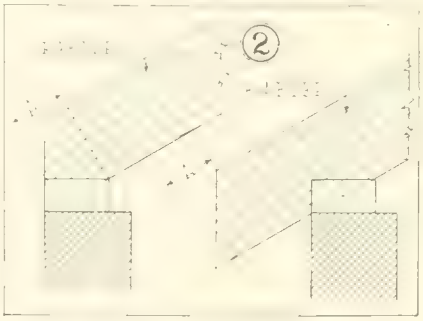
# Methods in Quantity Estimating
## Part XII. Roof Framing

*By Frederick H. Hunter, Quantity Surveyor*

THE measurement of lumber for floor joists, girders, etc., presents few difficulties, as these pieces can be measured at their true lengths directly from the framing plans. The joists for a flat roof can be measured in the same way, for while there is a slight pitch to such roofs, it is not enough to increase the length of the sticks perceptibly over the measurements showing on the plans. When scaling the rafters for a pitch roof, however, the situation is not so simple. If there is a roof plan, or a roof-framing plan, which is not always the case, the rafters are located,—or easily may be,—but they do not show at their true lengths on the plan, for the lengths of the lines on the plan are only of what carpenters call the "run" of the rafters.

Carpenters use the terms "run" and "rise" in connection with rafters as the base and altitude of a right-angle triangle, of which the actual rafter is the sloping side, or to use a geometrical term, the "hypothenuse." These are shown in Fig. 1 where A represents the "run," B the "rise," and C is the true length of the rafter. Usually the end view of the building will show the rafters in their true lengths. If the roof, then, is without hips or valleys, this solves the problem of finding the rafter lengths. It is necessary, however, in this connection, to study into the detail of the cornice and see whether the rafters are cut off square at the outer line of the plate, or if not, how much they extend beyond, to carry the cornice. Frequently the cornice is carried by false rafters spiked onto the side of the true rafters, or by some other means of blocking, and the structural rafters stop at the plate.

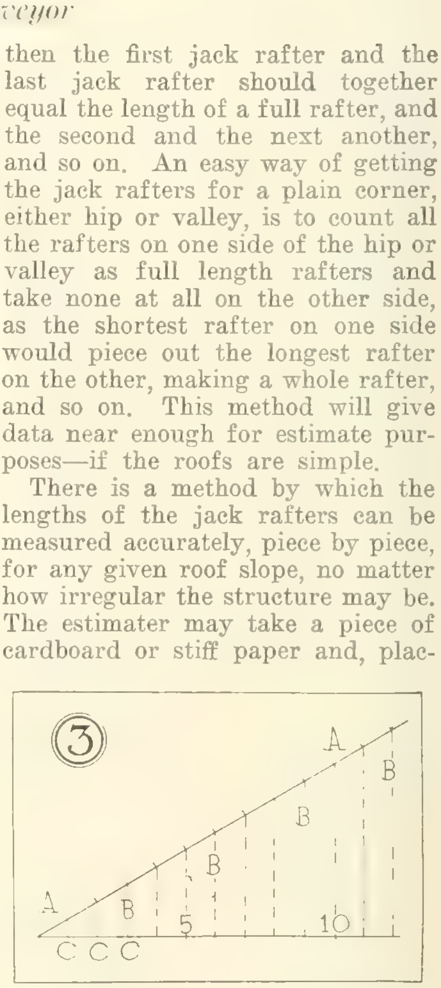




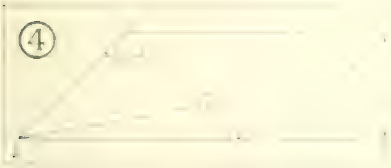
In measuring the rafter lengths from the end elevation of the building, the estimater must be sure that his measurement includes the "heel" of the rafter, as shown in Fig. 2, the heel being the projection of the rafter, A, caused by making a vertical cut, over what the length would be if the rafter were cut off square at the point where the cut starts. With these points in mind the actual lengths of the typical rafters can easily be found.

If a roof is complicated by hips and valleys, the problem at once becomes more difficult. If the building has square corners (right angles) and the 2 roofs which intersect at the hip or valley have the same pitch (slope),—and these conditions are both the usual thing,—then the first jack rafter and the last jack rafter should together equal the length of a full rafter, and the second and the next another, and so on. An easy way of getting the jack rafters for a plain corner, either hip or valley, is to count all the rafters on one side of the hip or valley as full length rafters and take none at all on the other side, as the shortest rafter on one side would piece out the longest rafter on the other, making a whole rafter, and so on. This method will give data near enough for estimate purposes—if the roofs are simple.

There is a method by which the lengths of the jack rafters can be measured accurately, piece by piece, for any given roof slope, no matter how irregular the structure may be. The estimater may take a piece of cardboard or stiff paper and, placing the lower edge in line with the horizontal lines of the plan, draw a slanting line (shown by A-A, Fig. 3) up from the corner at the pitch which the rafters show on the elevation. He should then lay off on this line, with a rule or scale, points 1/4 in. apart, or if the plans are drawn at 1/8-in. scale, place the points 1/8 in. apart; then draw vertical lines, B-B, etc., from these points to the bottom edge of the card. The spaces these lines mark off on the bottom edge of the card, C-C, etc., are of course closer to-



gether than the markings on the pitch line above, how much closer depending on how steeply the roof slopes. The bottom edge of the card now forms a scale rule, properly condensed, so that by laying it on the roof-framing plan (or if there is no roof-framing plan, then on the roof plan on which the rafters have been located), and the actual length of each rafter can be read off at once. In using this condensed rule, however, it must not be forgotten that if the jack rafter comes down to a valley or is cut off square at the plate, allowance must be made for the heel, as the reading on the condensed scale which has thus been made is taken from a flat plan on which the rafters show less than their true length. The lengths the estimater gets will be only the actual feet from the ridge or hip to where the bottom cut starts at the top edge of the stick. If he will keep in mind the extra length needed for the heel, which depends on the size of the stick and the pitch of the roof, he can read off piece by piece from the roof-framing plan in a few moments all the special rafters. The same scale can be used in determining the lengths of common and jack rafters on other roofs having the same pitch.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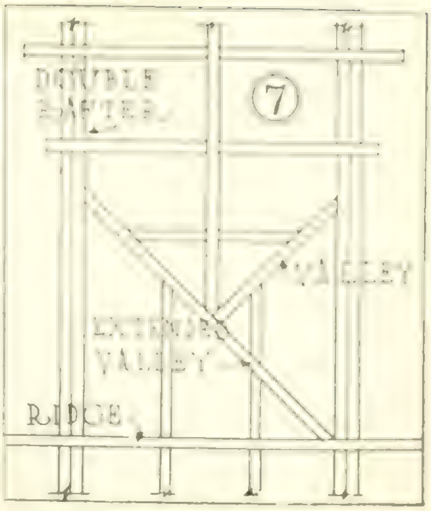
The method just described gives a way to find the lengths of all rafters that run with the pitch of the roof. Should there be more than 1 roof pitch on the building, a different diagram must be made, with a new condensed scale laid out for the rafters of the roofs which have a different pitch. These condensed scales can be saved for use on other buildings having roof pitches the same, or very nearly the same.

⑤

The hip and valley rafters require separate consideration, for the condensed rule we have described will not in any case give the true length of these. We have heard it said that finding the true length of the hip or valley rafters is the only "real trick" in estimating, and that with a proper set of plans, everything else can be determined by direct measurement, but the hip and valley rafters require special work. A moment's consideration, or a study of any hip roof, when it is being framed, will show that the hip and valley rafters run at a considerably flatter pitch than the regular or "common" rafters in the same roof; for this reason, a reading made with a condensed scale, made as we have just described for the regular rafters, will be considerably too long for the hips and valleys.

⑥

If there is a roof plan, or a roof-framing plan, the problem of finding the length of the hip rafters is comparatively simple. In this discussion we shall mention only the hip rafter, but the process of finding the valley rafter is exactly the same; and a hip rafter and a valley rafter running from the same eaves line to the same ridge will—unless the roof is irregular—be of the same length. From one end of the hip, as shown on the roof-framing plan (or the roof plan), the estimater should lay out a line at right angles to the hip, then on this line mark off the rise of the hip rafter, which is the same as the rise of the common rafter, that is, the vertical distance from eaves to ridge. This can be ascertained easily from the elevations of the building. From the point thus obtained on the right-angle line he should draw a line across to the other end of the hip rafter, and the length of this cross line will be the actual length of the hip, except that a few inches must be added for the heel, as explained for the regular rafters. As the hip rafters are not so steep as the typical rafters, less length will be taken up in the heel.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On Fig. 4, A-B is the hip rafter as shown on the roof plan and C-D is the rise of the rafters as shown on the elevation. The line B-E is now drawn at right angles to the line A-B and B-F is laid off equal in length to C-D. The distance A-F will scale the true length of the hip. Frequently where 2 hips come together on the roof plan, they will be at right angles and in such a case there is no need of constructing the line B-F as the other hip will furnish just such a line.

What we have really done in this process is to make a diagram giving the run and rise of the hip just the same as we did for the regular rafter in Fig. 1, except that for the latter we could find all the data on 1 drawing, while for the hip rafter we had to get the data from 2 different drawings. If there were a number of hips or valleys of different lengths but of the same pitch on the same building, we could take a piece of cardboard, and using the slant line which we have obtained in this diagram, make a condensed scale just as described for the common rafter, and with this we could read the lengths of each hip or valley. It is seldom, however, that there are enough hip and valley rafters of different lengths to make the construction of such a diagram worth while.

If there is no roof plan available, on which the run of the hip rafters can be found, there is another method which will give the true length of the hip rafters provided the 2 roofs intersecting are of the same pitch and at right angles to each other. After finding on the end elevation of the building the line that shows the true lengths of the common rafters (A-B on Fig. 5), from 1 end of this rafter line a line B-C should be drawn at right angles to it, and on this constructed line the run of the common rafters A-D be laid off. From the point E thus found, the measurement to the other end of the common rafters at A, which is the distance A-E, will be the length of the hip rafter. This method is much followed by carpenters, and is just as good as the other for the usual case, where the building has only square corners and all roof pitches are the same.

Once in a while we find a set of plans where the corners are not square or the roofs of the same pitch, so that this latter method cannot be used, and then if there is no roof plan on which the run of the hip rafters can be measured, it will be necessary to lay out enough of a roof plan to get the lines of the hips and valleys correctly located.

One curious point which we have noted in connection with hip and valley rafters, is that architects usually lay out both the hips and valleys of the same size of timber. A consideration of the work these 2 rafters have to do will show that the loads on the 2 sticks are very different. A hip rafter is supported by every jack rafter, once the roof is constructed, so that it has very little load to carry. After a roof is boarded in, a piece could be cut out of the hip rafter between where the pairs of jacks come in, and the roof would stand up without it. Of course the hip rafter needs a certain amount of stiffness to hold its alignment while the jacks are being nailed, but once this is done, its work is finished. A stick of the same size as the common rafter is amply strong for the hips in 9 cases out of 10. With a valley rafter, however, the situation is entirely different because every jack rafter carries its load to the valley rafter and increases the work that the stick has to do. A valley, moreover, is exactly the place that will get the worst of it in the case of a heavy snow load. We have never seen a hip rafter that was in the slightest danger of giving way, but we have seen plenty of valley rafters that were sadly overloaded. The proper size of timber to carry a given valley is a matter that should be carefully considered.

As already said, a valley rafter must be well supported as every jack rafter is held by it. Where a valley runs to the intersection of 2 ridges, the upper end, of course, is properly taken care of, but where an ell roof butts into a higher roof the 2 valleys will usually come together at the end of the low ridge. This makes a point of weakness as there is nothing to support the heavily loaded valley rafters. To overcome this weakness, 1 of the valley rafters must be continued until it comes up to the main ridge or meets a hip where it will get proper support. This means that the valley rafter will intersect the regular rafters above the meeting point, each bringing an additional load that the valley rafter will have to support. (See Fig. 6.) Frequently a larger stick must be used for this extended valley than for that on the other side.

For an ordinary dormer, where the framing is not heavy, 1 of the valley rafters is usually extended until it meets the doubled rafter which frames the side of the dormer opening as shown in Fig. 7. Sometimes it is necessary to support a valley rafter from the interior framing of the building, but this is not advisable if it can be avoided, as settlement due to the shrinkage of the timber is likely to be more for the interior framing than for the main framing of the walls. Of course in a brick building, with interior brick walls, there is a perfectly good bearing to support a valley rafter in the middle, as there would not be enough settlement in the brickwork to cause any trouble.

# Current Notes and Comments

*Continued from page 6*

### Labor Troubles Subsiding in Central Massachusetts

THE first settlement in the building trades' strike in Worcester and central Massachusetts was reached on April 30, when the bricklayers and plasterers accepted a cut of 15 cents an hour, bringing their hour wage down from $1.12½ to 97½ cents an hour, the accepted cut being a compromise from the 20% cut which the employers originally announced. The agreement was reached through conferences between representatives of the unions and the craft representatives on the Board of Councilors, Building Trades Employers' Association. Other agreements are near acceptance, all being compromises, and the gradual breaking up of the strike is looked for, through each side giving up a little. Each union is allowed to reach independently an agreement with its employes on the Board of Councilors.

The proposed large industrial business and apartment blocks, large garages, churches and other projects in Worcester have been held up on account of the labor dispute, but with the compromise in labor difficulties, general activity in new building is expected before July 1.

In Worcester, R. H. Long, the Framingham shoe manufacturer, will erect a $1,500,000 plant for the manufacture of automobile bodies, work having been started on excavation and grading of grounds. It will employ 10,000 hands. Regardless of the strike, general alterations are being made to Worcester stores, and work is being completed on several residences and garages. In Millbury, the school committee has deferred work on a new $25,000 school, expecting that material and labor prices will drop to a considerable extent. (*Leon J. Kreft, Webster, Mass.*)

### Confidence in Building Being Restored in Grand Rapids

THE building industry in this city seems to be enjoying a steady revival toward a normal basis. There is an extraordinary amount of figuring on new jobs and contractors say that if one-half of the work which is being figured goes through, they will have all they can do to keep up. The number of building permits being issued is increasing every day. Most of the permits are for new houses or remodeling jobs, but the increase shown establishes the fact that the people's confidence is being restored.

The labor situation is still easy, as quite a surplus exists and efficiency is up to normal now, according to the contractors. Common labor is being paid from 40 cents to 50 cents per hour, with no tendency toward a further reduction.

Some trouble has been experienced in the building trades, particularly with the plumbers, electricians and bricklayers, over wage reductions, but on the whole the reductions have been accepted as a necessary part of restoring building activity.

The rates of wages paid in the building trades from May 1 are:

| | Per hour |
|---|---|
| Sheet metal workers | $ .85 |
| Carpenters | .85 |
| Masons and bricklayers | 1.00 |
| Plumbers | .80 |
| Steamfitters | .90 |
| Electricians | .80 |
| Plasterers | .90 |
| Painters | .70 |

The formation of the state organization of building contractors is still continuing. This organization is called the Associated Building Employers of Michigan, and it is hoped that in due time every responsible contractor and subcontractor will become affiliated with it.

Bids have been opened on two new school buildings which will be erected, providing necessary legislation permitting cities to sell school bonds at 6% interest is passed by the state legislature. Schools are badly needed, and with sufficient inducement for the sale of bonds they will go ahead and will provide a good start toward normal building conditions. (*Harry P. Willwerth, Secretary Builders and Traders Exchange.*)

# *This* Face Brick Manual *will* Help You

A MANUAL of FACE BRICK CONSTRUCTION
A F B A

WHEN you are in doubt as to the best method of handling some problem, look it up in the *Manual of Face Brick Construction.*

This is a book for the practical man. Every question in regard to the correct method of building with face brick is answered simply and clearly. Diagrams and photographs are used profusely to illustrate the various subjects.

Prospective home builders are interested in the attractive homes illustrated in colors in the Manual. Thirty of these face brick homes are shown. Builders can secure blue prints, specifications, and bills of materials for them at nominal prices.

Every one interested in building finds this book of great value. It covers the subject of Face Brick Construction completely and authentically. You can not afford to be without a copy. The Manual costs but $1, postage prepaid. If it does not meet your expectations, return it and we will refund your money.

***Send your order to Dept. BJ6***

THE AMERICAN FACE BRICK
ASSOCIATION
**110 South Dearborn Street**
**Chicago**

# WHAT'S NEW

## New Materials and Equipment that Keep Your Work Up to Date

### A Double Blade Centrifugal Fan

THE Centrifugal Fan Co., 9 Seventeenth Avenue, Newark, N. J., is supplying a wide variety of fans which are useful in many instances where fans must be used to supply proper ventilation. Their "Four Leaf Clover" line includes several different types of fans, such as car exhausters, encased blowers, window exhausters, wind-propelled ventilators and ceiling fans, and these are to be had in sizes ranging from 4 ins. to much larger dimensions, which may be supplied in copper or galvanized iron, and of direct or indirect drive.

On account of the originality of their design these Four Leaf Clover fans have unusual force and handle a much greater quantity of air than might seem possible. Their double blades act with a powerful centrifugal force which draws the air toward the center of the blade unit and directs it along the plane of the fan's rotation.

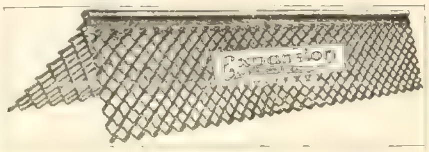
The purpose of the inner blade of the impeller is to divide the air current or stream into two parts, and thus prevent too great a pressure upon the outer blade. This means that the movement of air is less restrained by the surfaces of the blades in an impeller of this type than in the multivane type.

These exhaust fans are especially desirable for theaters, schools, lecture halls and public rooms of different kinds, and sometimes in factories, workshops, laboratories, garages and kitchens where it is necessary to maintain freshness of air.

Not the least of the advantages of the fans of the Four Leaf Clover line is that they are quite simply constructed, in a mechanical way, and therefore are not apt to get out of order and to cause trouble and expense in getting them repaired. Then too, these fans are noiseless in action, and since they operate on specially designed ball bearings they do not require lubrication.

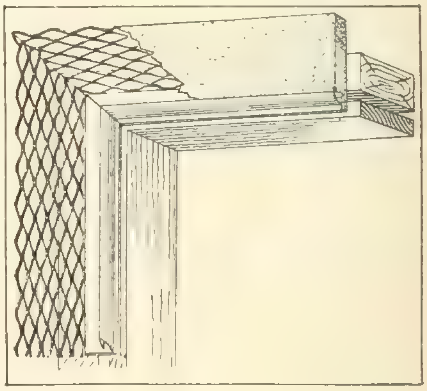
### An Innovation in Door Casings

THE Milwaukee Corrugating Co., 36th avenue and Burnham street, Milwaukee, is furnishing the Expansion Sanitary Flush Door Casing which will be useful to builders who have difficulty in treating door and window casings which occur in stuccoed or plastered walls.



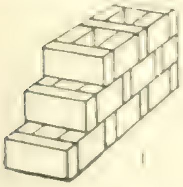
The Expansion building specialties include exterior and interior angle corner beads and three styles of door casings, which are different from the corner beads and door casings heretofore used. The wings of corner beads, for instance, have been solid metal, punctured at regular intervals to permit of a sort of grip on the plaster. Expansion beads are made with diamond mesh openings the entire length of the bead, which give it the same tenacious grip on the plaster as metal lath. The door casings, as shown in one illustration, have the same advantages.

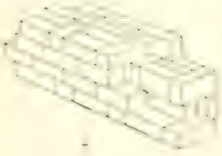
Both inside and outside corner beads and door casings are more easily attachable to any kind of building material because of their construction, and consequently they can be applied at a great saving of time. Every spring in the wings of the bead or casing presenting available attaching surface adapts itself to the most convenient points for fastening to different kinds of building material.

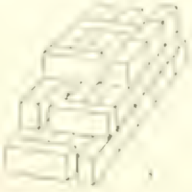


As shown in illustrations given here, an entirely new and unique feature is embodied in the Expansion Sanitary Flush Door Casings, namely, the expanded metal wings or webs. The expanded metal wings provide a tie with the adjoining wall and reinforce the plastering at its weakest point in such construction.

# IDEAL WALL
## Cuts Cost of Brickwork ⅓







1 8-inch Ideal All-Rolok Wall
2 12-inch Ideal Wall, Rolok backing — [illegible] ers every third course

3 12-inch Ideal All-Rolok Wall [illegible] spaced

# Ideal Wall Puts Brick Home Within Reach of the Average Man

A Builder needn't be a star salesman to sell attractive, fire-safe Brick homes at the cost of Frame. Nor need he endure long waits between sales—the new Ideal Wall changes all that.

The Ideal Brick Hollow Wall doubles your market. 95 people out of 100 prefer a Brick home to any other and they will buy now that the cost of wall construction has been cut one-third. ***Two*** renters can be converted into home owners for every ***one*** converted before.

Build Brick Homes with Ideal Walls. Any standard Brick, any wall thickness, bond or pattern. Save brick, mortar, labor, furring. Get speedier construction.

*Drop us a post card today, or obtain detailed information regarding Ideal Walls from your nearest Brick Manufacturer*

The Ideal Wall may be built in 8-inch and 12-inch and 16-inch thickness.

Uses any standard Brick—Common or Face—or combinations of the two.

Meets every engineering requirement.

Particularly adapted to residence construction, garages and small buildings.

Permits many variations in the width, color and treatment of mortar joint—any bond or pattern.

Completely dry—an air current constantly courses through it.

It saves brick, mortar, labor, time.

Gives permanent, fire-safe construction at cost of frame.

Simple to erect—bricklayers lay a greater area of wall per day.

One or more air spaces.

THE COMMON BRICK INDUSTRY OF AMERICA
1312 SCHOFIELD BUILDING
CLEVELAND, OHIO

**The Ideal Brick Hollow Wall**

# Selected List of Manufacturers' Literature

*FOR THE SERVICE OF BUILDERS, CONTRACTORS, ARCHITECTS AND ENGINEERS*

The publications listed in these columns are the most important of those issued by leading manufacturers identified with the building industry. They may be had without charge, unless otherwise noted, by applying on your business stationery to The Builders' Journal, 142 Berkeley Street, Boston, Mass., or the manufacturer direct, in which case kindly mention this publication.

Listings in this Department are available to any manufacturer at the rate of $5 per listing per month.

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## ASBESTOS PRODUCTS

- **Asbestos Shingle, Slate & Sheathing Co.,** Ambler, Pa.
  - Ambler Asbestos Shingles. Catalog 5½ x 8½ in. 40 pp. Illustrated.
  - Ambler Asbestos Corrugated Roofing and Siding. Catalog. 8½ x 11 in. 36 pp. Illustrated. Standard Purlin Spacing Tables.
  - Ambler Asbestos Corrugated Roofing and Siding. Catalog. 8½ x 11 in. 20 pp Illustrated Prices and specifications
  - Ambler Asbestos Building Lumber. Catalog. 8½ x 11 in. 32 pp. Illustrated.
  - Engineers' Data Sheets Catalog. 8½ x 11 in 40 pp. Illustrated. Specifications and working sheets for Ambler Asbestos Corrugated Roofing and Siding.
- **Johns-Manville, Inc.,** Madison Ave. & 41st St., New York, N. Y.
  - Johns-Manville Asbestos Wood Booklet. 3½ x 6 in 32 pp. Illustrated. Prices, construction data. List of uses for asbestos wood.

## BOILERS—See Heating Equipment

## BRICK

- **American Face Brick Association,** 1151 Westminster Bldg., Chicago, Ill.
  - The Story of Brick. Booklet. 7 x 9¼ in. 55 pp. Illustrated. Presents the merits of face brick from structural and artistic standpoints. Tables of comparative costs.
  - The Home of Beauty. Booklet. 8 x 10 in. 72 pp. Color plates. Presents fifty designs for small face brick houses submitted in national competition by architects. Text by Aymar Embury II, Architect. Price 50c.
  - A Manual of Face-Brick Construction. Booklet. 8½ x 11 in. Textbook on construction of the brick wall and various uses of face brick. 31 colored plates of brick houses with plans. Price, $1.00.
- **Bradford Brick Co.,** 2 Main Street, Bradford, Pa.
  - "Red" Catalog 7$\frac{5}{16}$ x 5 in. 30 pp. Illustrated. Covers dry pressed and impervious smooth-faced brick.
- **Common Brick Manufacturers Association of America,** 1309 Schofield Bldg., Cleveland, Ohio.
  - Brick for the Average Man's Home. Book. 8½ x 11 in. 72 pp. Color plates. Book of plans for bungalows, houses and apartments for which working drawings are available. Price $1.00.
  - Brick—How to Build and Estimate Book. 8½ x 11 in. 48 pp. Illustrated. A manual for the brick builder on estimating and details of brick construction. Price 25c.

## BUILDING STONE—See Stone, Building

## CEMENT

- **Alpha Portland Cement Company,** Easton, Pa.
  - Alpha Cement—How to Use It. Handbook 6 x 9 in. 96 pp. Illustrated. A practical handbook on popular forms of concrete construction, including form work, proper proportions in mixing, waterproofing, colored concrete, etc.
  - Alpha Service Sheets & Bulletins. Special suggestions on the construction of Industrial Housing, Garages, Inclosure Walls, Steps, Sidewalks, Barns, Silos, Farm Buildings, etc.
  - Alpha Aids. A bi-monthly magazine for those who buy, sell or use Portland Cement, sent complimentary to approved names.
- **Carney's Cement Company,** Mankato, Minn. Booklet. 8 x 10 in. 20 pp. Illustrated. Complete information on product, showing prominent buildings in which this cement has been used.
- **Sandusky Cement Co.,** Dept. F, Cleveland, Ohio.
  - Medusa White Portland Cement, Stainless. Booklet. 8½ x 11 in. 48 pp. Illustrated.
  - Medusa Waterproof White Portland Cement. Booklet. 6 x 9 in. 32 pp. Illustrated.
  - Medusa Review. 6 x 9 in. 18 pp. Illustrated. House organ issued bi-monthly.

## CONDUIT

- **National Metal Molding Co.,** 1113 Fulton Building, Pittsburgh, Pa.
  - Bulletin of all National Metal Molding Products. In correspondence folder 9½ x 11½ in.
  - Sherarduct. Circular. 5 x 8 in. Illustrated.
  - Flexsteel. Circular. 5 x 8 in. Illustrated.

## CONSTRUCTION, FIREPROOF

- **Bostwick Steel Lath Co., The,** Niles, Ohio.
  - After The Fire Booklet 6 x 9 in 13 pp Illustrated. Showing the fire-resistance of Bostwick "Truss-Loop."
- **National Fire Proofing Co.,** 250 Federal St., Pittsburgh, Pa.
  - Standard Fire Proofing Bulletin 171. 8½ x 11 in. 32 pp. Illustrated. A treatise on fire proof floor construction.
- **Northwestern Expanded Metal Co.,** 934 Old Colony Building, Chicago, Ill.
  - Fireproof Construction. Catalog. 6 x 9 in. 72 pp. Illustrated. Handbook of practical suggestions for architects and contractors. Describing Nemco Expanded Metal Lath.
  - Fire-proof Construction Handbook. 6 x 9 in 72 pp Illustrated. Describing Kno-Burn expanded metal lath.

## DAMPPROOFING

- **Truscon Laboratories, The,** Caniff Avenue and Grand Trunk R. R., Detroit, Mich.
  - Truscon Stonetex Booklet 5 x 8 in 36 pp. Illustrated A booklet telling of methods to decorate and make brick, stucco and masonry free from stains by the application of a cement coating.

## DOORS, WINDOWS AND TRIM, METAL

- **Dahlstrom Metallic Door Company,** 425 Buffalo Street, Jamestown, N. Y.
  - Architectural Catalog. 10 x 14 in. 46 pp. 11 sections. Illustrated. Catalog showing our regular styles and types of hollow metal doors and interior trim. Various types of frames and other architectural shapes also illustrated
  - Architectural Portfolio. 14 x 18 in. 30 pp. Illustrated. Portfolio of various designs and types of Dahlstrom doors. Drawings and details of each style or type. This is only sent free to reliable architects.
- **Detroit Steel Products Co.,** 2005 East Grand Blvd., Detroit, Mich.
  - Fenestra Sidewall Sash. Catalog 8½ x 11 in. 24 pp. Illustrated. Details of construction, installation and layout of Fenestra Solid Steel Sash.
  - Fenestra Underwriters' Sash Catalog. 8½ x 11 in. 20 pp. Illustrated. Details of construction, installation and layout of sidewall and counterbalanced sash as labelled and inspected under the supervision of the Underwriters' Laboratories, Inc.
- **David Lupton's Sons Company,** Witte & Tulip Sts., Philadelphia, Pa.
  - Catalog 10-LSS. 24 pp. Illustrated. 8½ x 11 in. Describing Lupton Pivoted Factory Steel Sash. Section drawings, different head and sill conditions and rules for ordering.
  - Catalog 10-PCS. 8½ x 11 in. 44 pp. Illustrated. Describing Pond Continuous Sash for side-walls, monitors and saw-tooth roofs.
  - Air and Light in Machine Shops. Catalog. 6 x 9 in. 42 pp. Illustrated. Showing the proper application of sash to machine shops.
  - Air and Light in Foundries and Forge Shops. Catalog. 6 x 9 in. 48 pp. Illustrated. Describing sash types for heat-producing buildings where unusual ventilation and daylighting are required.

## DUMBWAITERS

- **Kaestner & Hecht Co.,** Chicago, Ill.
  - Bulletin 520. Describes K. & H. Co. electric dumbwaiters. 8 pp.
- **Sedgwick Machine Works,** 151 West 15th Street, New York.
  - Catalog and Service Sheets. Standard specifications, plans and prices for various types, etc. 4¼ x 8¼ in. 60 pp. Illustrated.

## ELECTRICAL EQUIPMENT

- **Electric Boiler Corporation,** Cambridge, Mass.
  - Electric Boilerette. Booklet. 5 x 7 in. 18 pp. Illustrated. Describing an electrically-heated and automatically-controlled water-boiler for homes, offices, barber-shops, etc. Made in sizes from five to one hundred gallons capacity.
- **Frink, I. P., Inc.,** 24th Street and 10th Avenue, New York, N. Y.
  - Catalog 415. 3½ x 11 in. 46 pp. Photographs and scaled cross sections. Specialized bank lighting, screen and partition reflectors, double and single desk reflectors and Polaralite Signs.
- **Harvey Hubbell, Inc.,** State and Bostwick Sts., Bridgeport, Conn.
  - For Milady's Convenience. Booklet. 5 x 7 in. 18 pp. Illustrated. Booklet illustrating the use of electric current outlets in the home.
  - Electric Wiring Devices. Catalog. 8 x 10½ in. 126 pp. Illustrated. Covering the complete line.
- **Habirshaw Electric Cable Company, Inc.,** Yonkers, N. Y.
  - Plans and Specifications for the Home Electrical. Catalog. 11 x 14 in. 20 pp. Rubber, oiled paper, varnished cambric insulated wires and cables for every condition of service.
- **Kohler Co.,** Kohler, Wis.
  - Kohler Automatic Power and Light 110 Volt D. C. Booklet. 5 x 7 in. 32 pp. Illustrated. Describes a standard voltage automatic, electric power and light plant for isolated homes.
- **Adam Electric Company, Frank,** 3650 Windsor Pl., St. Louis, Mo.
  - The Answer to the Tenant Meter Problem. Booklet 6 x 9 in. 8 pp. Illustrated. Describing the Frank Adam Meter Control Panel Boards and Cabinets which are designed especially for the increase or the decrease of the tenants' requirements in the building.
  - The Floor-Box With the Reversible Cover. Circular 3¼ x 6¼ in. 8 pp. Illustrated.
  - Frank Adam Hanger Outlets. Circular 3½ x 6¼ in. Illustrated.
- **Simplex Wire & Cable Co.,** 201 Devonshire Street, Boston, Mass.
  - Simplex Manual Catalog and reference book. 6¾ x 4¼ in. 92 pp. Contains in addition to information regarding Simplex products, tables and data for the ready reference of architects, electrical engineers and contractors.

## ELEVATORS

- **Kaestner & Hecht Co.,** Chicago, Ill.
  - Bulletin 500. Contains 32 pp. Giving general information on passenger elevators for high buildings.
- **Otis Elevator Company,** 11th Ave. & 26th Street, New York, N. Y.
  - Otis Push Button Controlled Elevators. Booklet. 6 x 9 in. 56 pp. Illustrated. Detailed description of Otis Push Button Elevators. Their uses in residences, stores, institutions, apartment houses, business offices and banks, etc.
  - Otis Gravity Spiral Conveyors. Booklet. 6 x 9 in. 56 pp. Illustrated. Gravity spiral conveyors for lowering packaged merchandise, boxed, cased and bundled goods in factories, warehouses, terminal buildings, etc.
  - Otis Electric Traction Elevators. Booklet. 9 x 12 in. 28 pp. Illustrated. Full details and illustrations of Otis geared and gearless traction elevators for all types of buildings.
  - Otis Escalators. Booklet. 6 x 9 in. 36 pp. Illustrated. Description of step and cleat type single and double file escalators (moving stairways).
- **Sedgwick Machine Works,** 151 West 15th Street, New York.
  - Catalog and descriptive pamphlets. 4¼ x 8¼ in. 70 pp. Illustrated. Descriptive pamphlets on hand power freight elevators, sidewalk elevators, automobile elevators, etc.

Design No. [illegible]
Two Story, Six Room [illegible]

Design No. [illegible]
[illegible]

Design No. [illegible]
[illegible]

# Write for Folders Showing These Houses With Floor Plans in Colors

**MASTERTILE**
*[illegible]*
*Association Member*

Contractors and Builders can secure without charge large descriptive folders which show these homes in full, natural colors, give floor arrangement, and explain attractive features of the individual designs.

Complete sets of blueprints, specifications, and bills of materials for each of the home designs, garages and farm buildings offered by The Hollow Building Tile Association Plan Service can be secured from your local building material or lumber dealer or direct from the Association. Prices range from $2 a set for garages to $10 for residences.

These designs are very desirable and are of a high character which will appeal to particular people. They have been created by architects of recognized ability and are carefully worked out to afford a full measure of comfort and convenience to the average family. Of special value is the fact that these homes are economical.

The large units of Hollow Tile can be laid up very rapidly at a great saving of labor and mortar. They provide an ideal base for stucco finish, which can be applied economically. The permanent, enduring character of the burned clay provides a structural material that will never decay or require replacement. With repairing, replacement, painting and depreciation reduced to a minimum, the owner saves immeasurably through all the years he lives in the house because of the low carrying charges.

The air cells, which provide nonconducting, dead air spaces, guarantee insulation from heat, cold and dampness, and assure comfort and healthfulness the year around. The staunch, dense walls eliminate draughts and make the house easy to heat.

With our large descriptive folders and working plans of these homes at your disposal, you have an effective means of getting people to decide to build *now*. So write for these folders and plans now. To delay gives your competitor the advantage. Address Dept. 186.

THE HOLLOW BUILDING TILE ASSOCIATION
*Representing America's Leading Manufacturers*
Conway Building, Chicago

# HOLLOW TILE

*The Most Economical Form of Permanent Construction*

Design No. [illegible]
*Two Story, Six-Room Residence*

Design No. [illegible]
*Colonial Residence*

Design [illegible]
[illegible]

# SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 54*

## FENCES

**American Fence Construction Co.,** 106 Church Street, New York.

Afco Factory Fences. Booklet. 9 x 12 in. 32 pp. Illustrated.

Residential Fences. Booklets. 7 x 2½ in. Illustrated. A series of booklets on residential fences consisting of photographs and brief descriptions.

**Anchor Post Iron Works,** 165 Broadway, New York, N. Y.

Catalog 51. 8½ x 11 in. 53 pp. Illustrated. Anchor Post Fences for Country Place, Factory or Farm.

Catalog 54. 8½ x 11 in. 24 pp. Illustrated. Factory Fences.

## FIRE DOORS —See Doors, Windows and Trim, Metal

## FIREPLACE EQUIPMENT

**Covert Co., H. W.,** 137 E. 46th Street, New York, N. Y.

Hints on Fireplace Construction. Catalog. 5⅝ x 8½ in. 11 pp. Illustrated.

Diagrams of construction and installation of Covert "Improved" and "Old Style" Dampers and Smoke Chambers.

## FLOORING

**Armstrong Cork & Insulation Co.,** 132 24th Street, Pittsburgh, Pa.

Linotile Floors. Catalog. 6 x 9 in. 40 pp. Color plates. Describes Linotile, a composition of ground cork, wood flour, linseed oil and various gums and pigments in tile form.

The Ten-Point Cork Floor. Booklet. 3½ x 6 in. 16 pp. Shows design panels in color for Cork Tile floors.

**Armstrong Cork Co.** (Linoleum Dept.), Lancaster, Pa.

Armstong's Linoleum Floors. Catalog. 8½ x 11 in. 54 pp. Color plates. A technical treatise on linoleum, including tables and specifications for installing linoleum floors.

The Artistic Possibilities of Armstrong's Linoleum Floors. Booklet. 11¼ x 16½ in. 12 pp. Color plates.

Armstrong's Linoleum Pattern Book, 1920. Catalog. 3½ x 6 in. 176 pp. Color plates. Reproductions in color of all patterns of linoleum and cork carpet in the Armstrong line.

Quality Sample Book. Three books. 3½ x 5¾ in. Showing all grades and thicknesses in the Armstrong line of linoleum and cork carpets.

**Muller Co., Franklyn R.,** Waukegan, Ill.

Asbestone Composition Flooring. Circulars. 8½ x 11 in. Description and Specifications.

**Oak Flooring Manufacturers Association,** 1014 Ashland Block, Chicago, Ill.

Modern Oak Floors. Booklet. 6⅛ x 9¼ in. 24 pp. Illustrated. A general book that tells the complete story on Oak Flooring.

Oak Flooring, How and When to Use it. Booklet. 3½ x 6¼ in. 16 pp. Illustrated. A small, technical book showing the general rules, standard thickness and widths, how to lay, finish and care for oak floors.

## FLOOR HARDENERS

**General Chemical Company, The,** 25 Broad Street, New York, N. Y.

Hard-N-Tyte for concrete and mortars. Booklet. 3½ x 8½ in. 8 pp. Illustrated. Describes use of Hard-N-Tyte as application for hardening concrete floors.

**Sonneborn Sons, Inc., L.,** 266 Pearl Street, New York

Concrete and Lapidolith. Booklet. 5⅜ x 8⅛ in. 24 pp. Illustrated. Describing relation of Lapidolith chemical floor hardener to concrete construction.

Why Lapidolize? Booklet. 8½ x 11 in. 11 pp. Illustrated. Reasons why Lapidolith should be specified.

Lapidolith Specifications. Circular. 8½ x 10¾ in. 2 pp.

**Truscon Laboratories, The,** Cor. Caniff Avenue and Grand Trunk R. R., Detroit, Mich.

Agatex and Its Performances. Booklet. 8½ x 11 in. Describes the methods of hardening concrete floors by the application of a chemical which forms a new surface as hard as agate.

## FURNACES—See Heating Equipment

## FURNITURE

**Estey Organ Company,** Brattleboro, Vt.

Pipe Organs. Complete specifications and full information furnished to the architect for pipe organ to be installed in any given residence, upon receipt of plans and other particulars.

**Leavens Co., Inc., The William,** 32 Canal Street, Boston, Mass.

Catalog. 7 x 9 in. 200 loose leaved pp. Illustrated with wood cuts.

## GARAGE CONSTRUCTION

**Ramp Buildings Corporation,** 115 Broad Street, New York, N. Y.

The d'Humy Motoramp System of Building Design. Booklet. 8½ x 11 in. 20 pp. Illustrated. Describing the d'Humy system of ramp construction for garages, service buildings, factories, warehouses, etc., where it is desirable to drive automobiles and motor trucks or industrial tractors under their own power from floor to floor.

## GLASS CONSTRUCTION

**King Construction Company,** N. Tonawanda, N. Y.

Catalog No. 52. 9 x 11 in. 45 pp. Illustrated. Illustrating and describing greenhouses erected for private estates and public parks.

**Mississippi Wire Glass,** 220 Fifth Avenue, New York.

Mississippi Wire Glass." Catalog. 3⅞ x 8½ in. 32 pp. Illustrated. Covers the complete line.

## GRANITE—See Stone, Building

## HARDWARE

**Cutler Mail Chute Company,** Rochester, N. Y.

Cutler Mail Chute Model F. Booklet. 4 x 9¼ in. 8 pp. Illustrated.

**McKinney Mfg. Co.,** Pittsburgh, Pa.

McKinney Cabinet Hardware. Catalog. 6 x 9 in. 32 pp. Illustrated. Describes complete line of hardware for cabinet and furniture work.

McKinney Hardware for Sliding Doors. Booklet. 6 x 9 in. 18 pp. Illustrated. Describes different types of sliding door hardware.

## HARDWARE — Continued

**Stanley Works, The,** New Britain, Conn.

Wrought Hardware. Catalog. BJ10. 6½ x 10 in. Color plates. Shows all of the Stanley Works products made of steel from their own mills.

Eight Garages and their Stanley Garage Hardware. Booklet. 5 x 6¾ in. 32 pp. Illustrated. Illustrations and floor plans of eight typical garages that have been correctly equipped with Stanley Garage Hardware.

Ball Bearing Butts. Booklet. B8. 5 x 7¼ in. 32 pp. Illustrated. Concise description of various butts manufactured.

Stanley Specially Designed Garage Hardware. Booklet. B-50. 6 x 9 in. 24 pp. Illustrated. Detailed pictures and descriptions of various garage hardware equipment.

**Vonnegut Hardware Co.,** Indianapolis, Ind.

Von Duprin Self-Releasing Fire Exit Devices. Catalog. 12F. 8 x 11 in. 41 pp. Illustrated.

"Saving Lives." Booklet. 3¼ x 6 in. 16 pp. Illustrated. A brief outline why Self-Releasing Fire Exit Devices should be used.

## HEATING EQUIPMENT

**American Radiator Co.,** 816 South Michigan Avenue, Chicago, Ill.

Engineers' Data Book. 8 x 10¾ in. 48 pp. Illustrated. Valuable engineering data for estimating heating and ventilating requirements.

Ventilation for Vento Heaters. Catalog. 8 x 10¾ in. 24 pp. Illustrated. Examples of installation.

**James B. Clow & Sons,** 534 S. Franklin Street, Chicago, Ill.

Gasteam. Catalog. 6 x 9 in. 16 pp. Illustrated. New radiator using gas for fuel.

**Hess Warming & Ventilating Co.,** 1205D Tacoma Bldg., Chicago, Ill.

Modern Furnace Heating. Catalog. 6 x 9 in. 48 pp. Illustrated. Complete information on hot-air furnace heating useful to the architect and contractor regardless of what make of furnace he uses.

**Kelsey Heating Company,** James St., Syracuse, N.Y.

Booklet No. 5. 4 x 9 in. 32 pp. Illustrated. A dealers' booklet showing the Kelsey Warm Air Generator Method of warming and distributing air. Gives dimensions, heating capacities, weights, kind of coal recommended, and shows the mechanical and gravity system of heating homes, churches and schools.

Monroe Pipeless Booklet. 4½ x 8 in. 20 pp. Illustrated.

Monroe Tubular Heater. Booklet. 4½ x 8 in. 20 pp. Illustrated. General Booklet giving capacities, dimensions, weights, etc.

Syracuse Pipeless Booklet. 4½ x 8 in. 12 pp. Illustrated. General Booklet, giving sizes and capacities.

**Kewanee Boiler Co.,** Kewanee, Ill.

Kewanee on the Job. Catalog. 8½ x 11 in. 80 pp. Illustrated. Showing installations of Kewanee boilers, water heaters, radiators, etc.

Catalog No. 73. 6 x 9 in. 35 pp. Illustrated. Describes Kewanee steel power boilers with complete specifications.

Catalog No. 74. 6 x 9 in. 35 pp. Illustrated. Describes Kewanee steel heating boilers with specifications.

Catalog No. 75. 8½ x 11 in. 6 pp. Illustrated. Specifications on Tabasco Water Heaters, Kewanee water heating garbage burners and Kewanee steel tanks.

**Minneapolis Heat Regulator Company,** Minneapolis, Minn.

The Heart of the Heating Plant. Catalog. 6 x 9 in. 20 pp. Illustrated. Describing the Minneapolis Heat Regulator, its construction, application and operation for the automatic control of temperature where coal, gas, fuel oil or street steam is used.

**Page Boiler Company, The Wm. H.,** 141 West 36th Street, New York, N. Y.

Page Boilers. Catalog. 4½ x 8 in. 84 pp. Illustrated. Descriptions with specifications of the Volunteer Round and Monarch Square Sectional Boilers; also the Monarch Down-Draft Smokeless Boiler; with method for apportioning size of boiler and radiation, and other heating data.

**Smith Co., H. B.,** 57 Main Street, Westfield, Mass.

General Boiler and Radiator Catalog. 4 x 7 in. 90 pp. Illustrated. Giving ratings, dimensions, capacities and working pressures.

Engineer's Data Ring Book. 4 x 7 in. 125 pp. Illustrated.

Architect's and Contractor's Binders. These binders are made up of 9½ x 11 in. folders of different kinds giving dimensions, price lists, and erecting directions on the different lines of our manufacture.

**United States Radiator Corporation,** Detroit, Mich.

The Complete Line. Catalog. 4¼ x 7¼ in. 255 pp. Illustrated. Contains important technical information of special interest to architects and heating engineers.

Capitol Smokeless Type Boilers. Booklet. 8½ x 11 in. 12 pp. Illustrated. Describing a new type of low-pressure heating boiler which burns soft coal without smoke.

**Warren Webster & Co.,** Camden, N. J.

Webster Vacuum System of Steam Heating. Catalog. 8 x 10½ in. 36 pp. Illustrated. Describing the Webster Vacuum System of Steam Heating, its principles of operation, and advantages of installation.

Webster Feed-Water Heaters. Catalog. 8 x 10½ in. 28 pp. Illustrated. Describing the construction and operation of the Webster Feed-Water Heaters for steam-heating systems, power plants and industrial plants of every type.

## HEAT REGULATORS —See Heating Equipment

## HOISTS

**Gillis & Geoghegan,** 544 West Broadway, New York.

Hoists for Industrial Plants. Booklet. 6 x 8¾ in. 8 pp. Illustrated. Labor saving service in the lifting or lowering of lighter loads, through the use of G. & G. Telescopic and Non-telescopic Hoists.

Removing Ashes. Booklet. 6 x 8¾ in. 6 pp. Illustrated. Removing ashes from boiler room directly to wagon by electrically operated Telescopic Hoists.

## HOLLOW TILE—See Tile, Hollow

## Afco Fences Combine Ornament With Protection

THE illustration shows our solution of the fencing problem for a large textile mill. For that part of the grounds facing the street, Afco Iron Picket Fence was selected for its dignified appearance — the rest of the boundary was enclosed with Afco Chain Link Fence, with barbed wire overhang. Both types afford splendid protection, and each has been applied to the service for which it was particularly designed.

Among the wide variety of types and sizes of Afco Fences and Gates, you're certain to find several which will exactly meet your requirements. Our Service Department is at your disposal for the preparation of your fencing plans.

*May we send you our new Catalog B21?*

**American Fence Construction Co.**
**130 W. 34th Street - - New York**

Barriers of Steel
**Afco Fences**

[illegible]

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[illegible]

## Homes Built of REDWOOD are a credit to the Builder

IN mansion or bungalow, the use of Redwood for exterior construction and finish will do more than any other one thing to preserve the personality of a frame, [illegible] add to your reputation as a good builder.

### *Redwood resists rot*

Every fibre of Redwood is impregnated by nature with a preservative which prevents the growth of decay-producing fungi. Properly seasoned, Redwood [illegible] swelling. Climatic conditions and earth moisture do not weaken or rot Redwood.

[illegible]

### *Also resists fire*

[illegible]

### *Economical, too*

[illegible] Having a close grain and smooth texture, Redwood takes and holds paint well. In a Redwood house, repair and [illegible]

### *Information on Redwood every builder should have*

[illegible]

The Pacific Lumber Co.
REDWOOD

2071 McCormick Building - Chicago
New York City, N. Y. Kansas City, Mo.

THE PACIFIC LUMBER CO.
[illegible]

# SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 56*

## INSULATION

- **Bishopric Mfg. Company,** 103 Este Avenue, Cincinnati, Ohio.
  - Homes Built on the Wisdom of Ages. Catalog. 6 x 9 in. 48 pp. Illustrated. Describing the use of Bishopric Stucco-Board and Bishopric Sheathing Board.
- **Johns-Manville, Inc.,** Madison Ave. & 41st St., New York, N. Y.
  - Business Noise, Its Cost and Prevention. Booklet. 6 x 9¼ in. 16 pp. Illustrated. Data on correction of acoustics in offices, theaters, churches, etc.
- **Philip Carey Co., The,** Cincinnati, Ohio.
  - Carey Asbestos and Magnesia Products. Catalog. 6 x 9 in. 72 pp Illustrated.

## JOISTS AND STUDS, PRESSED STEEL

- **Truscon Steel Co.,** Youngstown, Ohio.
  - Truscon Standard Buildings, 4th ed. Catalog. 8½ x 11 in 40 pp. Illustrated. Erection details, cross-section diagrams and adaptations are given.
  - Truscon Structural Pressed Steel. Catalog. 8½ x 11 in. 24 pp. Illustrated. Information on Pressed Steel Beams and Joists for light occupancy buildings. Tables, specifications and views of installations.

## LATH, METAL AND REINFORCING

- **The Bostwick Steel Lath Co.,** Niles, Ohio.
  - Bostwick Steel Lath, Revised Edition 1920. Catalog. 9 x 11½ in 28 pp. Illustrated. Covers the entire line. Drawings and Specifications.
- **Corrugated Bar Company, Inc.,** Buffalo, N. Y.
  - Corr-Mesh. Catalog. 6 x 9 in. Illustrated. Describes the characteristics of Corr-Mesh, a ribbed expanded metal used in concrete and stucco construction.
  - Corr-Plate. Catalog. 6 x 9 in. 63 pp Illustrated. Describes a type of girderless floor construction in which the reinforcing bars are laid in two directions only.
- **North Western Expanded Metal Co.,** 934 Old Colony Building, Chicago, Ill.
  - Designing Data. Catalog. 6 x 9 in. 94 pp. Illustrated. Describes most efficient use of Econo Expanded Metal Reinforcing.
  - Formless Concrete Construction. Catalog. 6 x 9 in. 80 pp. Illustrated. Describes use of T-Rib Chanelath, a form and reinforcing for concrete.
- **Truscon Steel Co.,** Youngstown, Ohio.
  - Hy-Rib and Metal Lath. 18th ed. Catalog. 8½ x 11 in. 64 pp. Illustrated. Gives properties of laths, specifications, special uses and views of installations.

## LUMBER

- **Arkansas Soft Pine Bureau,** 802 Boyle Bldg., Little Rock, Ark.
  - Arkansas Soft Pine Handbook. Catalog. 8½ x 11¼ in. 62 pp. Illustrated. Concise, technical information regarding physical character, uses, and including Grading Rules and Standard Molding Designs.
  - The Home You Long For. Booklet. 8¼ x 11 in. 32 pp. Illustrated. Folio intended for the layman. Contains 18 homes by Robert Sayfarth, Architect, Chicago. Of general interest to architects, but does not contain technical information.
- **California Redwood Assn.,** 206 Marvin Bldg., San Francisco, Calif.
  - California Redwood Homes. Booklet. 6 x 9 in. 16 pp. Illustrated. Describes the use of Redwood Lumber for various places and conditions in the building of the home.
- **Long Bell Lumber Co.,** R. A. Long Building, Kansas City, Mo.
  - The Post Everlasting. Booklet. 10½ x 7½ in. 32 pp. Illustrated. Information regarding creosoted yellow pine fence posts, barn poles, paving blocks, etc.
  - Poles That Resist Decay. Booklet. 9¼ x 4 in. 16 pp. Illustrated. Poles for telegraph, telephone, high power transmission lines.
- **Pacific Lumber Company of Illinois, The,** 1105 Lumber Exchange Bldg., Chicago.
  - Engineering Digest. Redwood Information Sheets. 1. General Data Sheet on Redwood, its Production and Uses. 2. Tanks and Vats for Water, Acid and Alkali Solutions and Oil. 3. Pipe for Water, Chemicals and Sewage Conveying. 6. Farm and Dairy Buildings and Equipment, Silos, Tanks, Pipe, Outbuildings, Irrigation Flumes, Drainage Boxes, Greenhouses, Etc. 9. Railroad Construction and Equipment. 10. Industrial Building Materials. 11. Residential Building Materials.

## METAL LATH—See Lath, Metal and Reinforcing

## METALS

- **American Brass Co.,** Waterbury, Conn.
  - Illustrated Pamphlets. 8½ x 11 in. Describes the use and adaptability of Extruded Architectural Shapes, Benedict Nickel, Die Pressed Metals, Condenser Tubes, Brass and Copper Pipe and Commutator Copper.
- **American Sheet & Tin Plate Co.,** Frick Building, Pittsburgh, Pa.
  - Reference Book. Pocket Ed. 2½ x 4½ in. 168 pp. Illustrated. Covers the complete line of Sheet and Tin Mill Products.
  - Copper—Its Effect Upon Steel for Roofing Tin. Catalog. 8½ x 11 in. 28 pp. Illustrated. Describes the merits of high grade roofing tin plates and the advantages of the copper-steel alloy.
  - Apollo and Apollo-Keystone Galvanized Sheets. Catalog. 8½ x 11 in. 20 pp. Illustrated.
  - Research on the Corrosion Resistance of Copper Steel. Booklet. 8½ x 11 in. 24 pp. Illustrated. Technical information on results of atmospheric corrosion tests of various sheets under actual weather conditions.
  - Facts Simply and Briefly Told. Booklet. 8½ x 11 in. 16 pp. Illustrated. Non-technical statements relating to Keystone Copper Steel.
  - Black Sheets and Special Sheets. Catalog. 8½ x 11 in. 28 pp. Illustrated. Describes standard grades of Black and Uncoated Sheets, together with weights, bundling tables, etc.
  - Bright Tin Plates. Catalog. 8½ x 11 in. 16 pp.

## METAL TRIM—See Doors, Windows and Trim, Metal

## MORTAR COLORS

- **Clinton Metallic Paint Co.,** Clinton, N. Y.
  - Clinton Mortar Colors. Booklet. 3½ x 6⅜ in. 8 pp. Illustrated. Complete description of Clinton Mortar Colors with color samples.

## OFFICE SUPPLIES

- **Dixon Crucible Co., Joseph,** Pencil Dept., 224 J. Jersey City, N. J.
  - Finding Your Pencil. Booklet. 6¼ x 3¼ in. 16 pp. Illustrated.
  - The First Five. Booklet. 3½ x 5¼ in. 10 pp. Illustrated.
  - A Study in Sepia. Booklet. 7 x 4½ in. 5 pp. Illustrated.

## PAINTS, STAINS, VARNISHES AND WOOD FINISHES

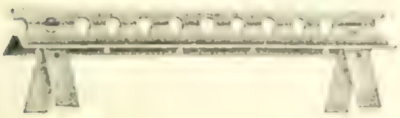
- **Berry Brothers,** Detroit, Michigan.
  - "Natural Woods and How to Finish Them." Booklet. 6½ x 4¾ in. 95 pp. Containing technical information and advice concerning wood finishing.
  - "Beautiful Homes." Booklet. 8½ x 6½ in. 26 pp. Illustrated in colors. Giving information to home builders and others on interior finishing.
- **Bird & Company, J. A. & W.,** 88 Pearl St., Boston, Mass.
  - Ripolin Specifications. Booklet. 8 x 10½ in. 12 pp. Description. Contains twenty-one carefully prepared specifications for undercoats for different types of work.
- **Boston Varnish Co.,** Everett Station, Boston, Mass.
  - The Inviting Home. Booklet. 5½ x 9 in. 16 pp. Color Plates. A briefly worded book on painting for the busy architect or decorator.
  - The White Enamel Specification Book. 6 x 9 in. 12 pp. Explaining the use of Kyanize White Enamel on interior or exterior surfaces.
- **Cabot, Inc., Samuel,** Boston, Mass.
  - Cabot's Creosote Stains. Booklet. 4 x 8½ in. 16 pp. Illustrated.
- **Fox Co., M. Ewing,** New York, N. Y.
  - Calcimines. Booklet. 3¼ x 6¼ in. 8 pp. Color cards.
- **O'Brien Varnish Co.,** 1121 Washington Avenue, South Bend, Ind.
  - That Magic Thing Called Color. Booklet. 5½ x 8½ in. 24 pp. Illustrated. Short treatise on the use of color in the home, special reference to walls and ceilings.
  - Architects' Specification Manual. 8½ x 11 in. 50 pp. Complete specifications for all paint products.
- **Ruberoid Co., The,** 95 Madison Avenue, New York, N. Y.
  - Preservative Coatings. Booklet. 6 x 9 in. 15 pp Illustrated. Presents in a concise manner the properties and uses of the Standard Paint Company's various paint preparations.
- **The Sherwin-Williams Co.,** 882 Canal Road, Cleveland, Ohio.
  - A Book of Painting and Varnishing Specifications. 8½ x 11 in. 30 pp. A text book on painting and finishing.
  - Announcement of Sherwin-Williams Flat-Tone Multi-Color Effects. Booklet 2½ x 6 in. 10 pp. Illustrated. Development of a new system of wall decoration.
  - Monthly Architectural Bulletin. 8½ x 11 in. Bulletin issued periodically on painting and finishing.
- **Smith & Co., Edward,** P. O. Box 76, City Hall Station, New York, N. Y.
  - Architect's Hand Book. 4¾ x 7½ in. 24 pp. Specifications and suggestions for painting, varnishing, enameling, etc.
- **Sonneborn Sons, Inc., L.,** Dept. 4, 264 Pearl Street, New York.
  - Paint Specifications. Booklet. 8½ x 10¾ in. 4 pp.
- **Truscon Laboratories, The,** Cor. Caniff Avenue and Grand Trunk R. R., Detroit, Mich.
  - Spread the Sunshine Inside. Booklet. 5 x 8 in. 24 pp. Describes methods for light saving by the application of light reflecting enamels to interior walls of factories and workrooms.
- **Wadsworth-Howland Co., Inc.,** Boston, Mass.
  - Paints and Varnishes. Catalog. 5¾ x 8½ in. 140 pp. Illustrated. Covers the complete line.

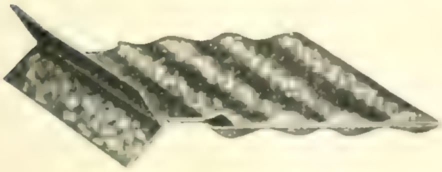
## PIPE

- **Clow & Sons, James B.,** 534 S. Franklin Street, Chicago, Ill.
  - Catalog "A." 4 x 6½ in. 706 pp Illustrated. Shows a full line of steam, gas and water works supplies.
- **National Tube Co.,** Frick Building, Pittsburgh, Pa.
  - National Bulletin No. 11, History, Characteristics and Advantages of National Pipe. Catalog. 8½ x 11 in. 48 pp. Illustrated.

## PLUMBING EQUIPMENT

- **Brunswick-Balke-Collender Co.,** 623 S. Wabash Avenue, Chicago, Ill
  - Whale-bone-ite Seat. Booklet. 3½ x 6¼ in. 4 pp. Illustrated.
  - Whale-bone-ite Seat. Booklet. 3½ x 6¼ in. 8 pp. Illustrated.
- **Clow & Sons, James B.,** 534 S. Franklin Street, Chicago, Ill.
  - Catalog "M." 9¼ x 12 in. 184 pp. Illustrated. Shows complete line of plumbing fixtures for Schools, Railroads and Industrial Plants.
- **Crane Company,** 836 S. Michigan Avenue, Chicago, Ill.
  - Crane Products in World Wide Use. Catalog. 5 x 9½ in. 24 pp. Illustrated.
  - Plumbing Suggestions for Home Builders. Catalog. 3 x 6 in. 80 pp. Illustrated.
  - Plumbing Suggestions for Industrial Plants. Catalog. 4 x 6½ in. 43 pp. Illustrated.
- **Hess Warming & Ventilating Co.,** 1205D Tacoma Bldg., Chicago, Ill.
  - Hess Sanitary Steel Medicine Cabinets. Booklet. 4 x 6 in. 16 pp. Illustrated.





Bostwick

means more than "TRUSS-LOOP"

*It means a complete line of Wall Specialties—from foundation up to eaves.*

The name BOSTWICK signifies the utmost in building materials—the trade's *standard*, no less. And that applies to the complete Bostwick line.

Owing to the fact that it was the first metal lath ("[illegible]" [illegible]) and to the "wholly different" features of "TRUSS LOOP"—its distinctive trussed arches, its remarkable strength and stiffness and its multiple time, labor and material saving qualities—BOSTWICK has become associated in the trade most prominently with "TRUSS-LOOP" Metal Lath. But the other specialties in the Bostwick line are equally as good—

Bostwick Expanded Metal Lath
Bostwick "Truss-V" Rib
Bostwick Corner Bead
Bostwick Base Bead
Bostwick Wall Plugs
Bostwick Wall Ties
Bostwick Channel Iron
Bostwick Heavy Expanded Metal
Bostwick Light Concrete Re-enforcements

Our new Catalog, just out, gives full details and specifications about the above specialties as well as Bostwick "TRUSS-LOOP" itself. We are reserving you a copy. A word from you will bring it.

Service? The usual Bostwick 24-hour shipment now prevails.

Bostwick

**The Bostwick Steel Lath Company**
NILES, OHIO

BUILDING
MATERIAL

STANLEY
ALUMINUM ZIG-ZAG
RULES

Page 18 of the No. 34 Stanley Tool Catalog shows the aluminum rule. Have you a copy?

**Here are some of the features:**

Made of unbreakable metal.

Graduations will not wear off and can be easily seen in dark places.

The depth of ordinary liquids can be measured without injury to the rule.

We recommend this type of rule to plumbers, carpenters and steam fitters. It is made in 4, 5 and 6 foot lengths.]

THE STANLEY RULE & LEVEL PLANT
The Stanley Works
New Britain, Conn., U. S. A.

# SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 58*

## PLUMBING EQUIPMENT Continued

**Kohler Co.,** Kohler, Wis.

Kohler of Kohler. 5½ x 8 in. 48 pp. Illustrated catalog. Shows complete line of plumbing fixtures.

Kohler Architect Specification Forms. 8½ x 11 in. Loose leaf portfolios intended to cover individual specifications. Separate illustrations and specification sheets provided.

**Maddock's Sons Co., Thomas,** Trenton, N. J.

Highest Grade Standardized Plumbing Fixtures for Every Need. Catalog. 5 x 7½ in. 94 pp. Illustrated. Covers the complete line.

Bathroom Individuality. Booklet. 6 x 9 in. 28 pp. Illustrated. Showing view of complete bathrooms with complete descriptions of floor plans.

Specifications for plumbing fixtures. Booklet. 9 x 12 in. 8 pp. Tables of specifications for industrial buildings, schools, apartments, hotels, etc.

**Speakman Company,** Wilmington, Del.

Speakman Showers and Fixtures. Catalog. 4½ x 7½ in. 250 pp. Illustrated. Catalog of Modern Showers and Brass Plumbing Fixtures, with drawings showing layouts, measurements, etc.

Toned Up In Ten Minutes. Booklet. 7½ x 10½ in. 16 pp. Illustrated. Modern Showers and Washups for Industrial Plants, showing the sanitary method of washing in running water.

## PUMPS

**Goulds Mfg. Co., The,** Seneca Falls, N. Y.

Set of Twenty Bulletins. 7½ x 10⅝ in. 12 to 32 pp. each. Illustrated. Covers complete line of power and centrifugal pumps for all services.

Catalog "K." 6 x 9 in. 216 pp. Illustrated. Covers complete line of smaller size pumps.

## ROOFING

**Creo-Dipt Company,** 1025 Oliver St., North Tonawanda, N. Y.

Architectural Service Sheets. 8½ x 11 in. Illustrated. Working drawings of construction, with standard specifications for design and construction of same.

**Philip Carey Co., The,** Cincinnati, Ohio.

Architects Specifications for Carey Building Material. 8½ x 11 in. 48 pp. Illustrated.

**Johns-Manville, Inc.,** Madison Avenue and 41st Street, New York.

Johns-Manville Colorblende Asbestos Shingles. Booklet. 3½ x 6 in. 32 pp. Illustrated. Prices, construction data and specifications.

Johns-Manville Roofing and Building Materials. Catalog. 3½ x 6 in. 24 pp. Illustrated. Describes building materials such as asbestos wood, sound deadening and insulating felts, waterproofing, etc.

**The Standard Paint Company,** 95 Madison Avenue, New York, N. Y.

Instructions for Laying Built-up Roofs. Booklet. 8½ x 11 in. Illustrated.

**Standard Paint Company,** 95 Madison Avenue, New York, N. Y.

Roofing Facts Worth Knowing. Booklet. 6 x 9 in. 16 pp. Illustrated.

**N. & G. Taylor Company,** 300 Chestnut Street, Philadelphia, Pa.

Selling Arguments for Tin Roofing. Booklet. 6¼ x 9¼ in. 80 pp. Illustrated. Describes the various advantages of the use of high grade roofing tin, gives standard specifications, general instructions for the use of roofing tin, illustrates in detail methods of application.

## SEWAGE DISPOSAL

**Kewanee Private Utilities,** 442 Franklin St., Kewanee, Ill.

Specification Sheets. 7¾ x 10¾ in. 46 pp. Illustrated. Detailed drawings and specifications covering water supply and sewage disposal systems.

## SHEATHING

**Bishopric Mfg. Company,** 103 Este Ave., Cincinnati, Ohio.

Homes Built on the Wisdom of Ages. Catalog. 6 x 9 in. 48 pp. Illustrated. Describing the use of Bishopric Stucco-Board and Bishopric Sheathing Board.

## STONE, BUILDING

**Harrison Granite Company,** 200 Fifth Avenue, New York, N. Y.

Harrison Granite Company, Clientele. 3¾ x 8¾ in. 24 pp. Illustrated. A partial list of clients with illustrations of examples of monuments and mausoleums.

**Indiana Limestone Quarrymen's Association,** Box 766, Bedford, Indiana.

Vol. 1. Indiana Limestone Library. 6 x 9 in. 36 pp. Illustrated. Giving general information regarding Indiana Limestone, its physical characteristics, etc.

Vol. 4. Indiana Limestone Bank Book. 6 x 9 in. 48 pp. Illustrated. Descriptive of the use of Indiana Limestone for bank buildings, with partial list of buildings in which it has been used.

Vol. 27. Designs for Houses of Indiana Limestone. 8½ x 11 in. 32 pp. Illustrated. Being the best designs submitted in competition for a detached residence faced with Indiana Limestone conducted by *The Architectural Review.*

**National Building Granite Quarries Association, Inc.,** 31 State St., Boston, Mass.

Booklet. 8½ x 11 in. 16 pp. Illustrated. Contains nineteen color plates of standard American Building Granites; specifications; classification listing colors, textures, and producers; detail sheets illustrating relative value of mouldings, economical design and typical construction; a general description of granite including uses, finishes, tests, etc.

## STORE FRONTS

**Kawneer Co., The,** Niles, Mich.

Kawneer Solid Copper Store Fronts. Catalog. "K." 8½ x 11 in. 32 pp. Illustrated. Information about various members used in the pioneer Kawneer construction.

A Collection of Successful Designs. Catalog. 9¼ x 6½ in. 64 pp. Illustrated. Showing by use of drawings and photographs many types of Kawneer Solid Copper Store Fronts.

**Zouri Drawn Metals Co.,** B. J. 10, Chicago Heights, Ill.

Architects' Catalog. 8¾ x 11¾ in. 86 pp. Illustrated. Showing a true copy of the approval of the Underwriters' Laboratories. Showing a proper glazing specification, based on the Underwriters' Report.

Catalog B. J. 8. 6 x 9 in. 68 pp. Illustrated. Key to Getting the People In.

## STUCCO, MAGNESITE

**American Materials Company,** 101 Park Avenue, New York; Weed Street and Sheffield Avenue, Chicago, Ill.

Elastica, the Stucco of Permanent Beauty. Catalog. 8½ x 11 in. 32 pp. Illustrated. Treatise on composition and application of Elastica Stucco.

**Muller, Franklyn R. Co.,** Waukegan, Ill.

Everlastic Magnesite Stucco. Booklet. 8½ x 11 in.

**United States Materials Co.,** Weed Street and Sheffield Avenue, Chicago, Ill. See American Materials Co.

## STUCCO BASES

**Bishopric Manufacturing Co.,** 103 Este Avenue, Cincinnati, Ohio.

Homes Built on the Wisdom of Ages. Catalog. 6 x 9 in. 48 pp. Illustrated. Describing the use of Bishopric stucco board and Bishopric sheathing board.

## TERRA COTTA

**Atlantic Terra Cotta Co.,** 1170 Broadway, New York, N. Y.

Questions Answered. Booklet, 7½ x 5¼ in. 32 pp. Illustrated.

**National Terra Cotta Society,** 1 Madison Avenue, New York, N. Y.

Standard Construction, Indexed, bound volume. 10½ x 16 in. 90 pp. 70 Illustrations. Standard forms of terra cotta construction with short article.

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"The Store." 10½ x 13½ in. 34 pp. 60 Illustrations. Types of store buildings with short descriptive articles. Volume III, brochure series.

**Northwestern Terra Cotta Co., The,** 2525 Clybourn Ave., Chicago, Ill.

Booklet. 8¼ x 11 in. 77 pp. Illustrated. Showing in a concise way the usefulness of terra cotta.

## THERMOSTATS—See Heating Equipment

## TILE, FLOOR AND WALL

**Associated Tile Manufacturers, The,** Beaver Falls, Pa.

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Swimming Pools. Booklet. 8½ x 11 in. 32 pp. Illustrated. A handbook on swimming pools and their construction.

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Tests of Alundum Tile. Booklet. 5 x 8 in. 18 pp. Illustrated. Describes its composition and proves its adaptability for its innumerable purposes.

## TILE, HOLLOW

**Hollow Building Tile Association,** Dept. 1812, Conway Bldg., Chicago, Ill.

Handbook of Hollow Building Tile Construction. 8½ x 11 in. 104 pp. Illustrated. Complete treatise on most approved methods of hollow tile building construction and fireproofing.

**National Fire Proofing Co.,** 250 Federal St., Pittsburgh, Pa.

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Industrial Housing Bulletin 172. 8½ x 11 in. 14 pp. Illustrated. Photographs and floor plans of typical workingmen's homes.

Natco on the Farm. 8½ x 11 in. 38 pp. Illustrated. A treatise on the subject of fire safe and permanent farm building construction.

Fireproof Buildings of Natco Hollow Tile. Booklet. 8½ x 11 in. 16 pp. Illustrated. Showing the use of Natco Hollow Tile for private residences.

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**Crane Co.,** 836 S. Michigan Ave., Chicago, Ill.

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**Gorton & Lidgerwood Company,** 96 Liberty St., New York, N. Y.

Gorton Quarter-Turn, Packing-Lock Valves. Booklet. 4¼ x 7¼ in. 32 pp. Illustrated. Describing a new type of valve for all systems of steam, hot water and vacuum heating.

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*Continued from page 60*

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The Webster Sylphon Trap. Booklet. 8 x 10½ in. 12 pp. Illustrated. Explaining the importance of the properly operating radiator return trap.

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**American Ventilating Company, The,** Martin Bldg., Pittsburgh, Pa.

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American-Larson Suction Ventilators. Catalog. 8¼ x 10¾ in. 24 pp. Illustrated. Description contains valuable data on adequate ventilation. All construction details fully illustrated and described. Gives methods of determining number and size of ventilators required for a given job, also charts, giving dimensions and prices.

**Globe Ventilator Co.,** Dept. P., Troy, N. Y.

Globe Ventilator's Catalog. 6 x 9 in. 32 pp. Illustrated.

**WALL BOARDS**

**Carey Co., The Philip,** Cincinnati, Ohio.

Carey Board for Better Building. Catalog. 6 x 9 in. 32 pp. Illustrated.

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**Minwax Company, Inc.,** 18 East 41st Street, New York, N. Y.

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**Ruberoid Co., The,** 95 Madison Ave., N. Y.

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**Sandusky Cement Co.,** Dept. F, Cleveland, Ohio.

Medusa Waterproofing. Booklet. 6¾ x 9 in. 37 pp. Illustrated.

**Toch Brothers,** 320 Fifth Ave., New York, N. Y.

Toxement. Booklet. 5¼ x 8⅛ in. Illustrated. 24 pp. Describes Toxement, an integral waterproofing compound for concrete, stucco, cement, mortar, etc.

**WATERPROOFING — Continued**

**Truscon Laboratories, The,** Cor. Caniff Avenue and Grand Trunk R. R., Detroit, Mich.

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**Detroit Steel Products Co.,** 2055 East Grand Bldg., Detroit, Mich.

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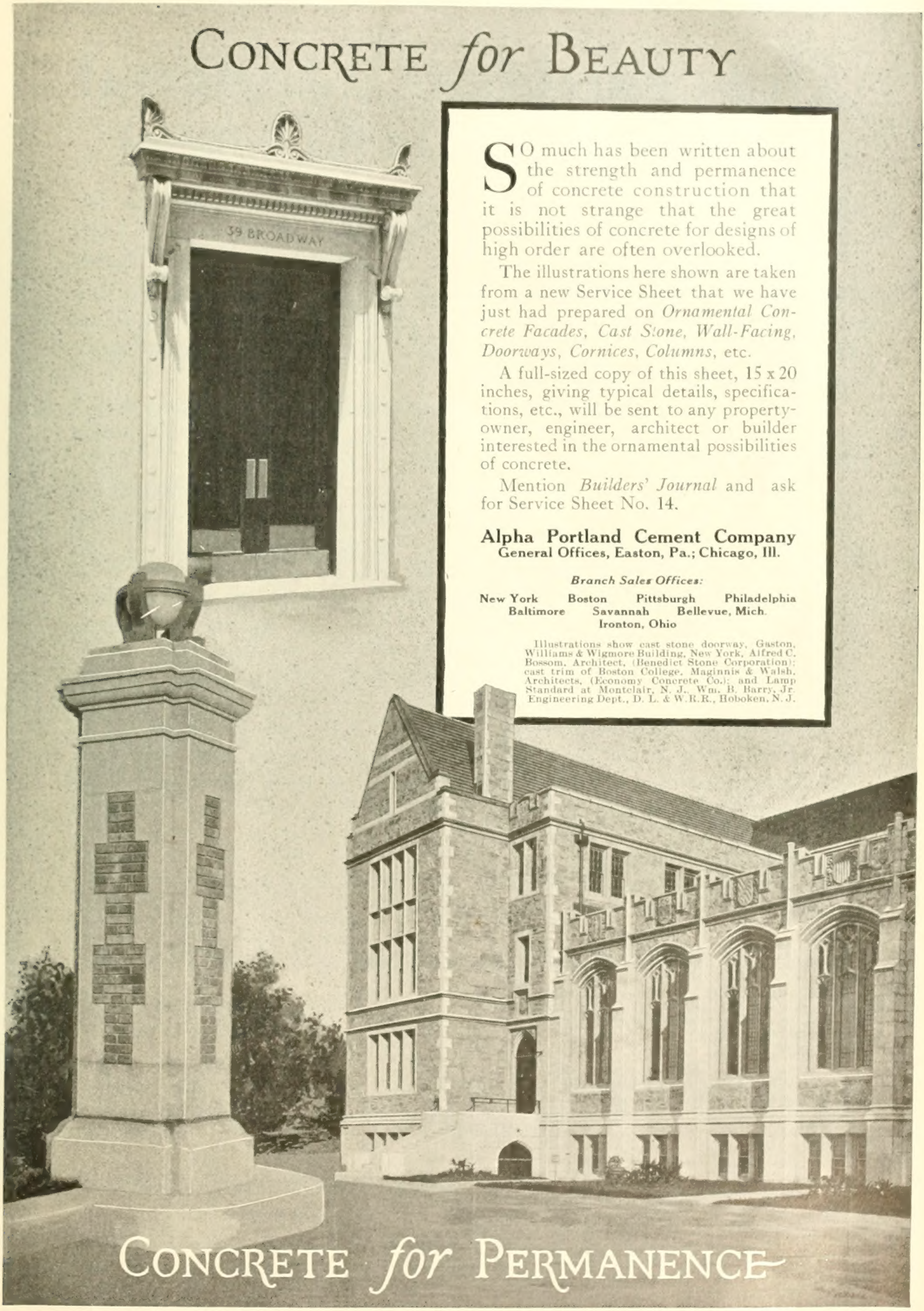

SO much has been written about the strength and permanence of concrete construction that it is not strange that the great possibilities of concrete for designs of high order are often overlooked.

The illustrations here shown are taken from a new Service Sheet that we have just had prepared on *Ornamental Concrete Facades, Cast Stone, Wall-Facing, Doorways, Cornices, Columns,* etc.

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# The Builders' Journal

## Is Looking Ahead to Big Building

RIGHT now builders may not find very much promise for building — materials are scarce and high priced, labor is high and inefficient, and many jobs don't go ahead because building loans can't be arranged. These conditions are difficult but they are not going to last forever. Nothing is needed more in this big country than buildings, and when the boom breaks every builder will be working overtime.

Prices are not going to be very much lower than present levels for several years. People will gradually realize this and find that they are only losing by waiting for a drop.

The builder to-day should study the needs of his locality, find out the people who will want to build soon and lay his plans so he will be able to serve them.

## The Opportunity is NOW

IT will be too late when the rush has started to think out building ideas. Take this time to look up customers, get their ideas and have plans made, watch the market conditions so you will be able to advise them when conditions are right. There are huge quantities of building ahead, make up your mind *now* to be ready for your share of it.

THE BUILDERS' JOURNAL will help you. We are on the job to find out the new ideas in building. In every number of the JOURNAL we give you articles on business building, information about labor saving equipment, photographs and drawings of the best buildings of different kinds that give you ideas for your own jobs. Every month has a complete set of blueprint plans and quantity survey for a small house from which you can actually build. The $2.00 THE BUILDERS' JOURNAL costs for a year will bring you ideas worth many times that amount.

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